Draft Report

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

18 March 2009

Economic Regulation Authority
WESTERN AUSTRALIA

A full copy of this document is available from the Economic Regulation Authority web site at www.era.wa.gov.au.

For further information, contact:

Economic Regulation Authority
Perth, Western Australia
Phone: (08) 9213 1900

Executive Summary

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

The inquiry is being 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.

This report is a draft report which provides a draft set of recommendations for tariffs that would apply from 1 July 2010 (the tariffs for 2009/10 are currently under consideration by the Government and are not yet available). The purpose of this report is to obtain feedback from interested parties on the draft recommendations. The final recommendations to the Treasurer (due by 15 June 2009) will take into account submissions in response to this report.

The Authority has based the draft tariff recommendations presented in this report on the Water Corporation's capital expenditure program that was endorsed by the Government in 2007/08. The draft tariff recommendations may need to be revised to reflect the Government's capital expenditure funding decision which will be made as part of the State Budget (which is anticipated to be in May 2009).

If the draft recommendations were to be implemented, the difference between what customers currently pay and what they would pay in 2012/13 would be as shown in Table 1.1 (the dollar increase or decrease is shown in the second to last column of the table). It is proposed that the payments be phased-in over the period to 2012/13, which means that the actual annual bill changes would add up to the totals provided in the second to last column of the table (with the changes in 2009/10 to be decided by the Government in the State Budget).

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 reductions to commercial water and wastewater customers in the country).

While the Authority's draft recommendation is for a 42 per cent increase in Perth household water bills (over the period 2008/09 to 2012/13), this impact will be partially offset by a 11 per cent reduction in Perth household wastewater bills (over the four year period). The total impact on households would be a 11 per cent increase in the combined water and wastewater bill between 2008/09 and 2012/13. While the cost of providing water services is becoming more expensive (e.g. to pay for the Southern Seawater Desalination Plant), the cost of providing wastewater services is becoming less expensive as the Water Corporation achieves economies of scale in a growing city.

Although not shown in Table 1.1, the average Water Corporation residential drainage customer would also pay an additional $8 per year in 2010/11 under the draft recommendations (increasing their annual payments from $65 to $73 per year in real dollars of 2008).

Table 1.1 Impacts of Draft Recommendations on Average Annual Payments for Water Corporation, Aqwest and Busselton Water Customers (Real Dollars of June 2008)

	Average Annual Payment ($)		Variation (2008/09 to 2012/13) $	Variation (2008/09 to 2012/13) %	Variation (average annual change) %
Household Water Bills	**2008/09**	**2012/13**			
Water Corporation, Perth	383	545	161	42%	9%
Water Corporation, Country	459	544	85	19%	4%
Aqwest, Bunbury	258	282	25	10%	2%
Busselton Water	274	258	-15	-5%	-1%
Household Wastewater Bills					
Water Corporation, Perth	530	473	-56	-11%	-3%
Water Corporation, Country	573	517	-56	-10%	-3%
Total Household Water and Wastewater Bills					
Water Corporation, Perth	913	1,018	105	11%	3%
Water Corporation, Country	1,031	1,061	29	3%	1%
Commercial Water Bills					
Water Corporation, Perth	1,223	1,677	454	37%	8%
Water Corporation, Country	8,441	6,724	-1,717	-20%	-6%
Aqwest, Bunbury	1,455	1,130	-325	-22%	-6%
Busselton Water	564	416	-148	-26%	-7%
Commercial Wastewater Bills					
Water Corporation, Perth	996	762	-234	-23%	-6%
Water Corporation, Country	1,320	747	-573	-43%	-13%
Total Commercial Water and Wastewater Bills					
Water Corporation, Perth	2,219	2,439	220	10%	2%
Water Corporation, Country	9,760	7,471	-2,290	-23%	-6%

Value of Water 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, Bunbury and Busselton. 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 $1.11 per kL up to 150 kL, $1.55 per kL from 151 kL to 500 kL and $2.00 per kL above 500 kL. Perth commercial customers would be charged $1.55 per kL.

The Authority's draft recommendation is that usage charges for Perth residential customers be transitioned by 2012/13 to $1.13 per kL up to 150 kL, $1.73 per kL from 151 kL to 500 kL and $2.57 per kL above 500 kL. Perth commercial customers would be charged $1.73 per kL from 2010/11.

The range of usage charges in the Authority's draft recommendation reflects the range of estimates of the value of water in Perth. These estimates were based on analysis of the short-term, medium-term and long-term value of water. The Authority estimated the long-term value of water as lying between $1.13 per kL and $2.57 per kL and applied these estimates as the lower and upper usage charges. The Authority estimated the short-term value of water as lying between $1.38 and $1.73 per kL and applied the upper estimate as the middle usage charge. The usage charges proposed by the Authority are higher than those proposed by the Water Corporation because of a provision for the environmental externalities associated with abstracting water from the Gnangara Mound (the Authority has assumed for pricing purposes that abstraction is lower than the level currently permitted by the Department of Water).

The Authority has made its draft recommendations after considering a range of options and concluding that the impacts of the draft 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).

Value of Water in Bunbury and Busselton

The value of water in Bunbury and Busselton is likely to be approximated by the value of water in Perth less a margin that would represent the cost of transporting the water to Perth. The value of water is higher in Perth than in Bunbury and Busselton because the cost of source development is significantly higher in Perth.

The Authority's draft recommendation is that usage charges for Bunbury residential customers be transitioned by 2012/13 to $0.63 per kL up to 150 kL, $1.23 per kL from 151 kL to 500 kL and $2.07 per kL above 500 kL. Commercial customers in Bunbury would be charged $1.23 per kL. These usage charges are all $0.50 per kL lower than the usage charges in Perth.

The Authority's draft recommendation is that usage charges for Busselton residential customers be transitioned by 2012/13 to $0.38 per kL up to 150 kL, $0.98 per kL from 151 kL to 500 kL and $1.82 per kL above 500 kL. Commercial customers in Busselton would be charged $0.98 per kL. These usage charges are all $0.75 per kL lower than the usage charges in Perth.

Residential Wastewater Charges 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 favours basing wastewater charges on estimated winter water usage. Generally, water usage in winter is for indoor purposes as there is less need to use sprinklers during winter. The wastewater discharged in winter is likely to be directly related to the amount of water used in winter (whereas during other months this is unlikely to be true). Basing wastewater bills on winter water usage is therefore likely to be the most cost-reflective approach to setting wastewater charges. It would require the Water

Corporation to move to quarterly billing, which it is understood is currently being considered. It is possible that this alternative approach could not be implemented by 1 July 2010, which is the date from which the tariff recommendations from this inquiry, if adopted, would apply. It may therefore be appropriate to apply a flat charge for the first year of the three year pricing period or until such time as the new approach could be implemented. A transition period of at least three years is then likely to be required to minimise financial impacts on customers (particularly for customers currently in relatively low valued properties).

Charges 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 increased significantly. 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 there is merit in considering a reduction in the uniform tariff threshold. It is currently set well 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 draft recommendation on this matter in this report but is interested in receiving submissions on the issue.

Charges for Drainage

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 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 issue has not been recommended for the coming regulatory period.

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 draft 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).
- For the length of the three-year regulatory period, the Water Corporation, Aqwest and Busselton Water should not be compensated whenever actual demand varies from forecast demand. Instead, the service providers should bear this demand risk.
- Any significant capital expenditure proposed by the Water Corporation that is more than a certain threshold amount should be subject to a capital expenditure efficiency test, conducted by the Authority under its inquiry function. Western Power is currently accountable for its capital expenditure in a similar way (although the Authority undertakes this role for Western Power as part of its regulatory function rather than as part of its inquiry function). The Authority welcomes submissions on the appropriate level of the threshold.
- 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 appropriate.
- The Authority will be investigating further the Water Corporation's operating expenditure to improve levels of service (i.e. expenditure above that required to maintain base operations).
- The Authority has not made any recommendations at this stage on the Water Corporation's capital expenditure program, as this program is currently before the Government for funding approval. Once the Authority is advised of the funded capital expenditure program, it will consider in more detail the appropriateness of the capital expenditure program. However, the Authority's consultants have advised that they are confident the Water Corporation has in place effective planning and prioritisation processes to guide capital expenditure decisions. For the purpose of calculating the tariffs in this draft report, the Authority has included the Water Corporation's currently approved capital expenditure program (i.e. based on its 2007/08 Strategic Development Plan).
- For Water Corporation, the rate of return (pre-tax real) should be decreased from 5.63 per cent to 5.41 per cent. For Aqwest and Busselton Water, the rate of return should be decreased from 5.87 per cent to 5.72 per cent.
- The initial regulatory asset values for Aqwest and Busselton Water be set at $11.3 million and $9.0 million respectively (as at 30 June 2005, in real dollar values of 2005). The initial regulatory asset value for Water Corporation was set in 2005 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. The fixed charge should then increase as meter capacity increases.
- The costs of providing wastewater services in country towns should be allocated between residential and commercial customers on the basis of relative discharge into the sewers. This would require the removal of the uniform approach to charging metropolitan and country commercial wastewater customers.

- The current subsidies to public and charitable institutions for water and wastewater services should be either paid for by a CSO 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.

The Authority wishes to thank those who provided the six submissions that were received in response to the Issues Paper. Those submissions have helped to formulate these draft recommendations.

The Authority now welcomes a further round of submissions on the draft recommendations. Submissions are due by 24 April 2009. Following receipt of those submissions, the Authority will prepare its final report for delivery to the Treasurer by 15 June 2009. The Treasurer is then required to table the report in Parliament within 28 days of its receipt.

Draft Recommendations

Water Tariffs for Perth, Bunbury and Busselton

1) Following consideration of a number of options, the Authority proposes that usage charges for Perth residential customers be transitioned by 2012/13 to $1.13 per kL up to 150 kL, $1.73 per kL from 151 kL to 500 kL and $2.57 per kL above 500 kL. Perth commercial customers would be charged $1.73 per kL from 2010/11.

2) Usage charges for Bunbury residential customers be transitioned by 2012/13 to $0.63 per kL up to 150 kL, $1.23 per kL from 151 kL to 500 kL and $2.07 per kL above 500 kL. Commercial customers in Bunbury would be charged $1.23 per kL.

3) Usage charges for Busselton residential customers be transitioned by 2012/13 to $0.38 per kL up to 150 kL, $0.98 per kL from 151 kL to 500 kL and $1.82 per kL above 500 kL. Commercial customers in Busselton would be charged $0.98 per kL.

4) The Authority recommends that the annual fixed charges for Water Corporation, Aqwest and Busselton Water be transitioned by 2012/13 to $144.15, $36.41 and $34.45 respectively.

Country Water Tariffs

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

6) For the purpose of calculating residential water usage charges, country towns be classified into 15 groups with the classification based on the relative cost of providing the water service to each town.

Wastewater Tariffs

7) Residential wastewater charges be no longer based on property values but instead be based on estimated winter water usage, which is a reasonable proxy for discharge into the sewer.

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

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

Drainage Tariffs

10) 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).

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

12) 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 $73.17 per year.

    b) Non-residential drainage customers with land area from 1,000 square meters to 10,000 square meters be charged $365.85 per year.

    c) Non-residential drainage customers with land area above 10,000 square meters be charged $731.70 per year.

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

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

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. The Authority will examine the cost reflectivity of the Water Corporation's minor tariffs for its final report.

16) Subsidies to public and charitable institutions for water and wastewater services be either paid for by a CSO 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.

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

18) 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.

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

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

Method for Calculating Revenue Requirement

21) 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).

22) The Water Corporation, Aqwest and Busselton Water 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.

23) For the length of the three-year regulatory period, the Water Corporation, Aqwest and Busselton Water should not be compensated whenever actual demand varies from forecast demand. Instead, the service providers should bear this demand risk.

24) Any significant capital expenditure proposal that exceeds a certain threshold amount be subject to a capital expenditure efficiency test, conducted by the Authority under its inquiry function (submissions are invited on the appropriate level of the threshold).

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 as a real annuity spread over the life of the Water Corporation's capital expenditure).

28) Cash contributions from developers be calculated consistent with the recommendations of the Inquiry into Developer Contributions to the Water Corporation (e.g. by excluding any contributions to source expenditure).

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

Operating and Capital Expenditure

30) 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.

31) Aqwest's and Busselton Water's revenue requirements be set on the basis of their operating and 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.

Rate of Return

33) For Water Corporation, the rate of return (pre-tax real) be set at 5.41 per cent.

34) For Aqwest and Busselton Water, the rate of return (pre-tax real) be set at 5.72 per cent.

35) 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.

Regulatory Asset Values

36) The initial asset values used for the purpose of determining tariffs be set at $11.3 million for Aqwest and $9.0 million for Busselton Water (as at 30 June 2005, in real dollar values of 2005).

37) The initial regulatory asset value for Water Corporation was set in 2005 and should not be revised.

Demand Management

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

39) Rebates for water efficient products (other than rain sensors, garden assessments and flow regulators) be discontinued, as the water savings achieved are more costly to society than the alternative of producing more potable water.

Cost Allocation

40) The annual fixed charge be set at the same level for all small-use water customers (those using a 20mm meter), whether they are residential or small business customers.

41) The uniform approach to charging metropolitan and country commercial wastewater customers be removed.

42) The costs of providing wastewater services within a scheme be allocated between residential and commercial customers in a way that is reflective of relative estimated discharge into the sewer.

Draft Tariff Recommendations

43) 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 H.

Contents

List of Tables

List of Figures

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 Corporation's water and wastewater tariffs and the Water Board's water tariffs. 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; i.e.

- 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, in 2005, was the first independent inquiry into urban water and wastewater tariffs in Western Australia;
- Water Corporation's country water and wastewater tariffs (2006);
- 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); and
- the bulk water supply agreement between Harvey Water and the Water Corporation (2007).

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 decided by Government. The Authority has also undertaken (in 2008) an annual review of the tariffs charged by Aqwest and Busselton Water.

The Authority has also recently completed inquiries into:

- competition in the water and wastewater services sector;
- developer contributions to the Water Corporation; and
- pricing of recycled water.

As a result of previous water and wastewater pricing inquiries:

- Metropolitan water usage charges are moving towards long run marginal cost, which is the 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 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 recommendations to the Government on tariffs.

Other jurisdictions have established independent water and wastewater price regulators (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 and make excessive profits. 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 draft recommendations, the Authority first establishes the efficient costs of the businesses. For a given forecast of demand, tariffs are then calculated such that efficiently-incurred costs are recovered. 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.

[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.

- Appendix D sets out other regulated tariffs of the Water Corporation.

1.3 Structure of the Report

The report consists of three parts.

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

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

Part 2 presents draft 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 draft tariff recommendations for each water business.

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

1.4 Review Process

The recommendations of this inquiry will be informed by the following public consultation process:

- An Issues Paper was released on 4 August 2008 and six submissions were subsequently received.
- This Draft Report invites a further round of submissions from stakeholder groups, industry, government and the general community on the matters in the draft recommendations. Submissions are due by 24 April 2009.
- Following consideration of submissions received on the Draft Report, the Authority is required to present the Final Report to Government by 15 June 2009.
- The Treasurer will, in accordance with the Act, then have 28 days to table the report in Parliament.

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

1.5 How to Make a Submission

Submissions on any matters raised in this Draft Report or in response to any matters in the Terms of Reference should be in written and electronic form (where possible) and addressed to:

Inquiry on Tariffs of the Water Corporation, Aqwest and Busselton Water
Economic Regulation Authority
PO Box 8469
Perth Business Centre
PERTH WA 6849

Email: watertariffs@era.wa.go.au
Fax: (08) 9213 1999

Submissions must be received by 24 April 2009.

In general, submissions from interested parties will be treated as in the public domain and placed on the Authority's web site. Where an interested party wishes to make a confidential submission, it should clearly indicate the parts of the submission that are confidential. For more information about the Authority's submissions policy, see the Authority's web site, www.era.wa.gov.au

The receipt and publication of a submission shall not be taken as indicating that the Authority has knowledge either actual or constructive of the contents of a particular submission and, in particular, whether the submission in whole or in part contains information of a confidential nature and no duty of confidence will arise for the Authority in these circumstances.

Further information regarding this inquiry can be obtained from:

Mr Greg Watkinson
Director, References and Research
Economic Regulation Authority
Ph (08) 9213 1900

Media enquiries should be directed to:

Mr Paul Byrne	Ph (08) 9336 2081
Byrne & Byrne Corporate Communications	Mb (0417) 922 452

PART ONE: DRAFT GENERAL RECOMMENDATIONS

2 Water Usage 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 Draft Recommendations

Draft Recommendations

1) Following consideration of a number of options, the Authority proposes that usage charges for Perth residential customers be transitioned by 2012/13 to $1.13 per kL up to 150 kL, $1.73 per kL from 151 kL to 500 kL and $2.57 per kL above 500 kL. Perth commercial customers would be charged $1.73 per kL from 2010/11.

2) Usage charges for Bunbury residential customers be transitioned by 2012/13 to $0.63 per kL up to 150 kL, $1.23 per kL from 151 kL to 500 kL and $2.07 per kL above 500 kL. Commercial customers in Bunbury would be charged $1.23 per kL.

3) Usage charges for Busselton residential customers be transitioned by 2012/13 to $0.38 per kL up to 150 kL, $0.98 per kL from 151 kL to 500 kL and $1.82 per kL above 500 kL. Commercial customers in Busselton would be charged $0.98 per kL.

4) The Authority recommends that the annual fixed charges for Water Corporation, Aqwest and Busselton Water be transitioned by 2012/13 to $144.15, $36.41 and $34.45 respectively.

2.3 Reasons

The range of usage charges in the Authority's draft recommendation for the Water Corporation reflects the range of estimates of the value of water in Perth. These estimates were based on analysis of the short-term, medium-term and long-term value of water. The Authority estimated the long-term value of water as lying between $1.13 per kL and $2.57 per kL and applied these estimates as the lower and upper usage charges. The Authority estimated the short-term value of water as lying between $1.38 per kL and $1.73 per kL and applied the upper estimate as the middle usage charge. The usage charges proposed by the Authority are higher than those proposed by the Water Corporation because of a provision for the environmental externalities associated with abstracting water from the Gnangara Mound (the Authority has assumed

for pricing purposes that abstraction is lower than the level currently permitted by the Department of Water).

The usage charges for Aqwest and Busselton Water reflect the view that the value of water in Bunbury and Busselton is likely to be approximated by the value of water in Perth less a margin that would represent the cost of transporting the water to Perth.

The Authority has made its draft recommendations after considering a range of options and concluding that the impacts of the draft recommendations 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, tenants and pensioners).

2.4 Background

Historically, water prices were either charged on a fixed annual basis or determined under a 'rates-based' approach. The price charged bore no relationship to the volume of water used. 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 have increasingly favoured a method for setting water usage charges which bases pricing policy on the average incremental cost of adding more supply (referred to as "long run marginal cost (**LRMC**)" pricing). 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 bills that other users will have to pay at some point in the future.

The Government decided to implement LRMC pricing for the Water Corporation's metropolitan customers but, following advice from the Authority, did not do 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.

[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.

In addition, the Government announced as part of the last 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, following the Authority's advice to the Government preceding the 2008 budget.

2.5 Proposals by Service Providers

Water Corporation's proposed approach to setting metropolitan residential water usage charges was summarised in its submission:

> Metropolitan residential water usage charges should be based on the Long Run Marginal Cost (LRMC) of new sources, but with a higher charge applied to very high consumption. The Corporation considers that a three tiered water usage charge for residential customers is optimal, in addition to a fixed annual charge to ensure revenue sufficiency. Indicative results from the Corporation's preliminary assessment of the LRMC are:
>
> - First Taper: $1.11 / kL (or the lower end of the LRMC range)
> - Second Taper: $1.55 / kL (or the middle to upper end of the LRMC range)
> - Third Taper: $2.00 / kL (being the indicative cost of future potable water from the seawater desalination)
>
> The above prices are largely consistent (although slightly higher) with the prices and reforms currently being implemented. The marginal increase is justified given that the costs of new sources have also increased since the previous assessment.
>
> Furthermore, the Corporation proposes a reduction in the target taper thresholds as follows:
>
> - First Taper: 0 – 300 kL p.a.
> - Second Taper: 301 to 500 kL p.a.
> - Third Taper: > 500 kL p.a.
>
> The reduction in the thresholds (from 550 kL and 950 kL) will further encourage the efficient use of water. The current thresholds are considered too high to be effective as only 6% of all water supplied is priced at the second or third taper prices.
>
> Again, on the basis of further encouraging the efficient use of water, there may be additional merit in reducing the taper thresholds beyond those proposed above (to say 150 and 300 kilolitres). This water efficiency objective, however, should be weighed up against the potential impact that a reduced threshold might have on large families (whose essential use component is greater than 150 kilolitres per year) and the short term impact on tenants.
>
> (Water Corporation submission, p9-10)

For non-residential water usage charges, the Water Corporation has proposed:

> the new target for the non-residential water usage charge is $1.55/kL, with appropriate matching reductions to the service charge to maintain revenue sufficiency. The new target price reflects the upper range of the revised LRMC estimate. The Corporation recognises that any figure within the $1.11 to $1.55/kL LRMC range may be an appropriate consumption charge and prefers that the upper range is targeted as:
>
> (i) It more closely reflects the actual average cost of new sources (average estimated at $1.75/kL). The upper range of the LRMC therefore provides a stronger price signal to encourage the investigation of efficient alternative water sources and is consistent with the objectives of the State Water Recycling Strategy.
>
> (ii) The greater the emphasis on the consumption charge (relative to the annual service charge) the better charges reflect the principle of "user pays"; and

(iii) A higher consumption charge is more likely to encourage the adoption of water efficient appliances and measures.

The Corporation supports the continued phase-in to reduce the number of tapers from three to one, as well as the continuing to target 2013/14 as the year in which all changes are finalised.

(Water Corporation submission, p8-9)

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)

The Authority did not receive a submission from Busselton Water.

2.6 Assessment

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

a) Are the LRMC estimates provided by the Water Corporation reasonable estimates of the value of water in Perth? Consideration is given to the assumptions underlying the LRMC calculation and the appropriateness of LRMC as a measure of the value of water.

b) Are the Water Corporation's proposed tariff structures, for example the three tiers of usage charges for metropolitan residential customers, appropriate?

c) What are appropriate values of water in Bunbury and Busselton, and how should the water tariffs be structured in those locations?

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.

Assumptions about the Current and Future Demand for Water

For a given supply of water, as demand increases, the value of water increases. The demand for water is influenced by population growth and average per capita demand.

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

> [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. Restrictions are put in place because 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 were instead unrestricted demand. This is because of the particular way that LRMC is calculated.[4]

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

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).[5]

Availability and Cost of Dam Water

The assumption of inflows into the dams has a significant impact on the value of water because without inflows, relatively inexpensive water becomes scarce, and more expensive water sources need to be developed.

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.

---

[4] 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 level of demand in the base case.

[5] 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 a negative externality and has a lower value if the use of that water causes a positive externality.

> 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 has accepted the Corporation's assumptions about inflows.

Availability and Cost of Groundwater

Abstraction of groundwater from Gnangara Mound currently accounts for approximately 60 per cent of metropolitan water supply. In 2008/09, abstraction from Gnangara Mound is expected to be 147 GL.

The Water Corporation assumes a long term abstraction level of 120 GL per year from the Gnangara Mound:

> [The Water Corporation's source development plan for pricing purposes assumes] the long term sustainable groundwater abstraction of 120 GL per year, drawn under the current variable abstraction arrangement. This is below the current arrangement which targets 135 GL per annum. (Water Corporation submission, p15-16)

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).

The Department of Water provided the following advice to the Authority:[6]

> 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 inflows, that is, allocations will be based on water that enters the system through recharge, or, more simply, water in equals water out.[7]
>
> 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

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

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

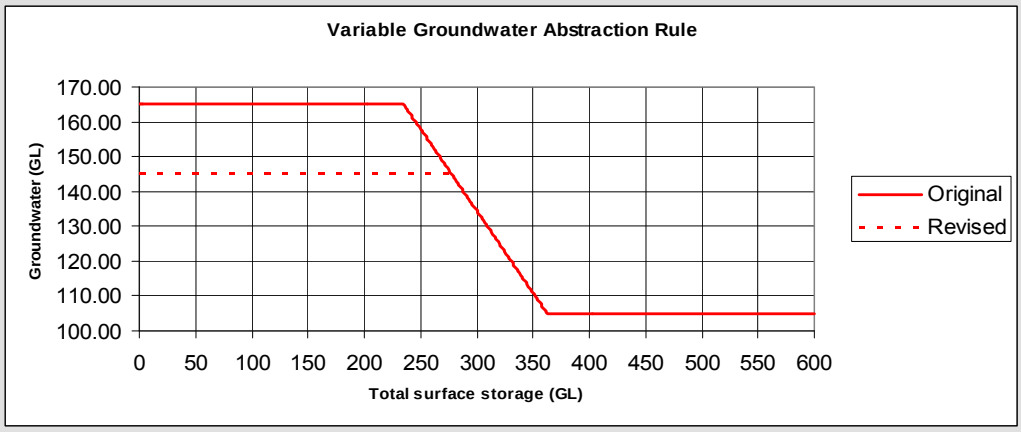
Corporation is not necessarily a "sustainable" level of abstraction. Furthermore, the target would need to be revised as knowledge increases about how groundwater levels respond to reduced abstraction.

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[8]

Groundwater accounts for approximately half the water requirements of the 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 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. However, it is understood that in exceptional circumstances an abstraction of 165 GL/year may be permitted.

It seems clear that if additional sources were available to meet potable demand, the Department of Water would have reduced groundwater abstraction by users of the Gnangara Mound.

The Authority considers 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

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

added to water usage charges in the short term to reflect the possible environmental externality. It is possible that such a premium could be identified by basing the LRMC calculations on reduced abstraction from the Gnangara Mound in the short term.

Size and Cost of Future Sources

The opportunity value of using water today is impacted by the cost of replacing that water.

The Water Corporation explained the assumptions it has made about future sources in its submission.

> [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.

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 allowed for consumption this year).

The Water Corporation's long term security assumption is as follows:

> [The Water Corporation's source development plan for pricing purposes assumes] a long term average security of supply of no less than a 2% (1 in 50 year) chance of a total sprinkler ban. (Water Corporation submission, p17)

The Water Corporation's short term security is provided for by assuming ongoing 2 day per week sprinkler restrictions.

The Authority has accepted the Water Corporation's assumptions about security 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 2005/06, 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 the Authority advised the Government in 2005 on the value of LRMC, 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).

For the purpose of calculating LRMC, the Authority has accepted all of the Water Corporation's revised assumptions except for the assumption about groundwater abstraction. The Authority considers that the assumption about groundwater abstraction in the LRMC calculation, at least in the short term, should be based on a lower estimate of abstraction than that assumed by the Water Corporation. This issue is discussed further in the next section.

2.6.2 Are There any Reasons for Not Using LRMC as the Reference Point for Setting Water Usage Charges?

The Authority has considered the following issues:

- Whether LRMC adequately identifies the long term value of water.
- Whether the long term or short term value of water should be reflected in usage charges.
- Whether there are specific circumstances in Bunbury and Busselton that influence the way water usage charges should be set.

Does LRMC adequately identify the long term 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.

LRMC pricing was established as a method of smoothing fluctuations in price in situations where additional capacity requirements are relatively predictable.

The situation in Perth is more complicated than the standard LRMC pricing situation. The complication is caused by uncertain inflows which provides uncertainty in the source development plan on which the LRMC calculation is based.

A particular issue with the LRMC approach is the sensitivity of the LRMC calculation to the assumptions. As was discussed in the previous section, the Authority considers that LRMC should be based on a lower level of abstraction from the Gnangara Mound than assumed by the Water Corporation. However, Table 2.1 indicates that the LRMC calculation is sensitive to variations in the groundwater abstraction rule.[9]

[9] It has been assumed that the Water Corporation assumption of a 165 – 105 GL groundwater abstraction rule applies for the period 2021 to 2108. This assumption provides a long run average groundwater abstraction of 120 GL.

Table 2.1 Sensitivity of LRMC to Groundwater Abstraction by the Water Corporation (Real Dollars of June 2008)

Groundwater Abstraction Rule for Period 2008 - 2020 (GL)	Average Groundwater Abstraction 2008-2020 (GL)	Lower Estimate of LRMC (Assuming Progressively Declining Dam Inflows)[10]	Upper Estimate of LRMC (Assuming Dam Inflows Based on the Period 2001 – 2008)[11]
(1)	(2)	(3)	(4)
165 – 105	115 - 129	$1.11 per kL	$1.54 per kL
145 – 105	114 - 126	$1.11 per kL	$2.13 per kL
140 – 100	110 - 121	$1.12 per kL	$2.35 per kL
135 – 95	107 - 118	$1.13 per kL	$2.57 per kL[12]

In column 1, various groundwater abstraction rules are presented. The current settings in the LRMC model are 165 GL for maximum abstraction (when dam levels are relatively low) and 105 GL for a minimum abstraction (when dam levels are relatively high). In this case, the average groundwater abstraction for the period 2008 – 2020 are 115 GL and 129 GL, respectively, as shown in column 2.

As previously discussed, the Water Corporation has proposed two inflow scenarios. Under the first scenario, inflows get progressively worse over the next 100 years, which is presented in column 3. Under the second scenario, inflows are assumed to continue at the average level for the period 2001 to 2008, as shown in column 4.

It can be seen in column 4 of Table 2.1 that the upper estimates of LRMC are very sensitive to the assumption about groundwater abstraction while the lower estimates of LRMC, shown in column 3, are not. The table also shows that average groundwater abstraction for the period 2008-2020 does not change as significantly as the upper estimates of LRMC change.

This approach indicates that estimating an externality premium in this way does not appear to be very robust. This analysis also indicates that the Water Corporation's proposed range of LRMC estimates is also subject to significant uncertainty. If it were not for the agreement by the Department of Water to allow the Water Corporation to take 165 GL of groundwater in "exceptional circumstances", the upper estimate of LRMC would be $2.13 per kL.

Another issue with the LRMC approach is the sensitivity of the calculation to the period over which the calculation is made. The Water Corporation has used a period of 100 years to calculate LRMC.

> While the Corporation supports the notion of prices reflecting the LRMC of new sources, an issue for consideration is the time period over which the LRMC is calculated. The [Water Corporation's LRMC] calculation is based on a notional 100 year forecast. This is consistent with the approach adopted by the ERA in previous inquires. (Water Corporation submission, p8)

[10] This estimate of LRMC assumes the decrement from 155 GL to 135 GL.

[11] This estimate of LRMC assumes the increment from 155 to 165 GL.

[12] Note that the LRMC can be higher than the cost of the most expensive source (which is approximately $2 per kL) due to short term under-utilisation of sources.

If Water Corporation's upper and lower estimates of LRMC are recalculated for the next 20 years instead of the next 100 years, the resulting range is $0.71 per kL to $1.37 per kL rather than $1.11 per kL to $1.54 per kL. If the estimates are recalculated for the next 50 years the resulting range is $1.03 per kL to $1.54 per kL. The sensitivity of LRMC to the period indicates that the results need to be used with caution.

Other issues with the LRMC approach include:

- the inconsistent results obtained when calculating LRMC by using different variations in demand (e.g. by using decrements rather than increments, and by using large variations in demand rather than small variations);
- the inconsistent results obtained between using the Turvey approach (the one the Water Corporation uses, in which the cost consequences of increments or decrements in demand are calculated) or the average incremental cost approach (where the per kL cost of meeting growth in demand is calculated); and
- the assumption of constant technological progress (desalination technology is not assumed to get cheaper, contrary to historical experience).

Overall, the Authority is aware of the shortcomings of the LRMC approach but acknowledges that there may not be a better approach of estimating the long term value of water. However, the lack of robustness in the LRMC approach, particularly given the current circumstances of inflow uncertainty, indicates that consideration should be given to calculating the value of water over a shorter time frame using a different method.

If LRMC is to be used, and provision is made for the externality consequences of using groundwater from the Gnangara Mound, the Authority's conclusion is that estimates of the LRMC for Water Corporation's metropolitan water service could range from $1.13 per kL to $2.57 per kL, which is a wider range than proposed by the Water Corporation.

Should a long term or short term value of water be reflected in water usage charges?

Given the preceding discussion, an issue for the Authority is whether water usage charges should be set on the basis of LRMC or on the basis of a calculation of a shorter-term value of water (e.g. the value for the next three years, or even the value for the coming year).

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

> 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, p7)

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

> While the investigation of alternatives to the LRMC by the ERA is not opposed, it is noted that there is an increasing understanding of the 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, p4)

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

- greater certainty about the assumptions underlying the value of water;
- greater scope for using price to defer large source developments if there is uncertainty about their utilisation; and
- the potential to use price rather than restrictions to address short-term water shortages.

The Productivity Commission recently concluded that one of the sources 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]

The Department of Water indicated the efficiency of water usage could be improved under a short-term pricing arrangement:

> Under the current water pricing system, water prices are exactly the same in drier years as in normal years. Conceptually, a system where prices reflected the availability of water could encourage more efficient water use. Unlike water restrictions, it could also encourage reduced and more efficient indoor use. (Department of Water submission, p4)

However, significant concerns were raised in submissions about pricing on the basis of a short-term value of water:

> **Water Corporation**
>
> Water demand is typically insensitive to price (price inelastic) and the degree of sensitivity uncertain. Restrictions are a more reliable approach to managing demand when facing short term supply shortages.
> …
>
> Fluctuations in the price of water may lead to uncertainty about long term water costs and therefore may not promote efficient investment in long term water saving initiatives such as water efficient gardens and whitegoods.
> …

[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*.

Additionally, scarcity pricing would have distributional impacts which have clear economic costs. When the water available is constrained by poor inflows, consumption by one customer is at the expense of another. Increasing the price does not increase the amount of water available. An affluent customer would be able to afford to continue to water their lawns inefficiently 7 days a week while a pensioner may not be able to afford to water then at all. Under the existing arrangements, two day a week restrictions allows them both to enjoy their gardens, under scarcity pricing only one does. This would clearly be a net cost to the community. Compensating the pensioner will not alter the situation if the affluent customer can continue to use water inefficiently. (Water Corporation submission, p11-13)

WACOSS

In previous submissions WACOSS has made a point of identifying significant concerns regarding the potential equity issues arising from scarcity based pricing arrangements for some residential consumers. Additionally, WACOSS also suggests that scarcity based pricing, if incorporated into current models of billing, would likely have limited effect in delivering price signals to consumers and subsequent reductions in demand during times of scarcity.

Given that households living on lower incomes have a relatively lower rate of discretionary water consumption and therefore a relatively reduced capacity to further conserve water, scarcity based pricing is likely to create additional costs for the households that can least afford them. Additionally, potentially higher rates of nondiscretionary use amongst such households would mean that poorer households may be even more vulnerable to increases in price than other households.

Under the current retail billing model, the Water Corporation invoices water consumers in metropolitan areas with bills for volumetric consumption twice yearly. In rural and regional areas served by the Corporation, this may be more frequent at once every four months. WACOSS suggests that the relative infrequency of volumetric water billing significantly reduces the effectiveness of scarcity based pricing to signal the consumer. This is because the consumer may not get billed for several months following the period of scarcity, reducing the association between scarcity and price.

…

Given that both regarding the [in]efficacy of scarcity based pricing in conveying useful information both to market and to the consumer as well as significant concerns regarding social equity, WACOSS cannot support the adoption of scarcity based pricing. (WACOSS submission, p10)

Submissions also commented on the scope for providing less reliance on restrictions following the planned introduction of the second desalination plant in 2011/12.

Department of Treasury and Finance

The decision whether to retain sprinkler restrictions after the commissioning of the Southern Seawater desalination plant will be an important decision for the Government of the day. In considering its options, the following matters will need to be considered:

- the general government sector operating surplus would be improved in the short term if restrictions were removed, primarily due to the increase in water sales revenue (and associated dividends) by the government owned retail service providers;
- in the longer term, because sprinkler restrictions reduce demand, removing those restrictions may necessitate the earlier development of a new water source, which would increase pressure on the State's net debt levels;
- water restrictions, together with the adoption of improved water efficiencies, have led to a shift in consumer behaviour which may not be reversed, or at least will only be partially reversed, if sprinkler restrictions are abolished. The quantum of this shift in consumer behaviour will directly impact on the level of supply augmentation in the longer term;

- sprinkler restrictions impose costs to the community (the Productivity Commission estimates those costs at $67 per householder per annum) and there is an argument that if the community is willing to pay the full cost of their water demand (which is the sum of the long run marginal cost of supply and the costs of the associated externalities), then their supply should not be arbitrarily limited by government regulation; and
- permanent water restrictions were mandated throughout the State in October 2007 and the removal of sprinkler restrictions would be inconsistent with the achievement of the target of 100kL annual per person consumption levels for household use by 2012, as outlined in the 2007 State Water Plan.

(Department of Treasury and Finance submission, p12)

Water Corporation

Market research conducted in 2007/08 established that 93% of Perth scheme users support the current sprinkler roster, with similarly high figures for regional and Perth bore users….

The Southern Seawater Desalination Plant should not be seen as a means to replace efficient demand management measures, but rather to complement them and strengthen the Corporation's diversified approach to water management.…While the Corporation maintains that the two day per week sprinkler roster is an efficient and effective approach to watering, it would consider its support for relaxing them at some point in the future provided:

- 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;
- The water efficient behaviours have been instilled in the community as a matter of habit; and
- There is community support to modify the sprinkler roster.

(Water Corporation submission, p46-47)

WACOSS

Given that water restrictions target non essential use of water such as garden reticulation, swimming pools and hosing down paved areas, paths, roads and buildings, WACOSS proposes they continue as they promote a culture of water conservation, and asserts that they are a more effective demand management tool than using increased tariffs as price signals. (WACOSS submission, p13)

WACOSS believes that demand restrictions will reduce reliance on the desalination plants; which in turn will reduce green house gas emissions and associated carbon costs to consumers, as well as delaying the need for new water infrastructure. Demand restrictions will also reduce additional environmental costs which should also be factored into any future water source. (WACOSS submission, p14)

The Department of Treasury and Finance submitted that more work needs to be done to establish the current value of water before using this as the basis of setting water prices:

Any water charging principles that recognise and capture the opportunity cost of water are supported. However, there are a number of areas that need to be considered in far more detail (which are likely to include a number of barriers to be overcome) before such pricing structures could be implemented. These include, but are certainly not limited to, the following:

i. the definition of scarcity and the appropriate trigger points and how those trigger points are affected by the advent of further climate independent sources;

ii. the responsiveness and frequency of billing and the need for billing cycles to be in line with the changes to the prices charged (where those charges fluctuate); and

iii. the ability of service providers to respond to the change in water scarcity through their billing systems.

It is suggested that further work be undertaken on these matters, as a separate exercise to this current pricing inquiry, so that the outcomes of any such investigations might be available for consideration in the next major pricing review, in 2013-14. Further investigation into scarcity pricing would also be consistent with the recent recommendations of the Productivity Commission and the National Water Commission. (Department of Treasury and Finance submission, p5)

Assessment

The Authority has summarised the concerns raised with setting usage charges to reflect the short term value of water, as follows:

- 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 the infrequency of billing.
- More work needs to be done to establish a short-term value of water upon which to determine the current value of water.

The Authority has considered each issue in turn.

Restrictions versus Higher Water Usage Charges

An argument 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. A problem is that no-one is entirely clear how high the water usage charge would need to go to ration demand. Therefore, it is argued, restrictions are a more reliable means of achieving water savings.

The Authority understands that any pricing recommendations from this inquiry would not be implemented until 1 July 2010, which is only a year before the second desalination plant is planned to be operational. The concern about what price level would be required to achieve a required level of water savings as water restrictions would be less of a concern at that time, as the system would be secure given that a major augmentation is imminent.

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

The Authority therefore does not consider that the uncertainty of the responsiveness to price is a reason to not use a short term pricing approach.

The Authority also notes that when the LRMC theory was developed, it was not envisaged that restrictions would be permanent. Rather, LRMC pricing typically embodies a security buffer that averts the need for restrictions by providing sufficient excess capacity. LRMC pricing would generally see the restrictions removed once security of supply is restored.

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 a concern, the water service provider could indicate the LRMC to customers in their water bills. Alternatively, the value of water could be determined over a three-yearly rather than annual basis.

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 suffer a similar loss in well-being.

The distributional benefit associated with restrictions comes at an economic cost. The use of demand restrictions rather than price results in a misallocation of resources: those who are prepared to pay the 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.

Conceptually at least, there are ways of achieving a more efficient allocation of water than by having water restrictions, but without having the distributional consequences associated with 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 do value the money over the water would be compensated and they would be able to spend their proceeds on other goods and services. However, those without much need for the water entitlement, e.g. because they don't have a garden or lawn, 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, this means that it is low water using 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 there are arguments, on distributional grounds, for and against using restrictions rather than price. However, preventing 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.

[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.

Billing Frequency

On the issue of the effectiveness of short-term pricing in the situation where people do not receive bills very often, it is understood that the Water Corporation is considering increasing their meter reading to four reads 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.

Establishing a Current Value of Water

Typically, the value of a resource is determined in a market. However, there is no market for water. The value of water can therefore only be estimated on the basis of a set of assumptions. The Department of Treasury and Finance raised the concern that establishing a short-term value for water would require a substantial amount of work.

The short term value of water can be determined by estimating the supply and demand for bulk water on the basis that there were a wholesale market for metropolitan water supply.[17]

The Authority has undertaken an exercise to calculate the value of water that might arise in such a wholesale market and has established that many of the assumptions underlying such a calculation are similar to those that underlie the LRMC calculation. A model that could be used for calculating the short term value of water is described in Appendix E. The Authority welcomes comments on the usefulness of this model for determining a short term value of water.

As with the LRMC calculation, the calculation of a short-term value of water is sensitive to the assumptions. Two particularly sensitive assumptions are the level of groundwater abstraction and the assumption about how far the usage charge would have to increase by to achieve water savings equivalent to the savings achieved by the current restrictions. Table 2.2 indicates the short term value of water calculated by varying these two assumptions.

For example, if it is assumed that 120 GL of groundwater abstraction is permitted (the second row of the left column) and if it is assumed that the average water usage charge would need to increase to $2.00 per kL to achieve water savings equivalent to the savings achieved by the current restrictions (the middle column), then the short term value of water would be $0.99 per kL. Appendix E provides a detailed explanation about how these values are determined.

Underlying the data in the table is an assumption that dam inflows will continue at the level of the period 2001 to 2008.

[17] 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).

Table 2.2 Alternative Calculations of the Short Term Value of Water (i.e. the Average Value over the Period 2010/11 to 2012/13) Real Dollars of June 2008

Groundwater Abstraction Rule (GL)	Level of Usage Charge Required to Achieve Equivalent Water Savings as Under Demand Restrictions	
	$2.00 per kL	$2.50 per kL
145 – 105 [(a)]	$0.60	$0.73
Flat 120	$0.99	$1.23
Flat 110	$1.38	$1.73

Notes: (a) For example, under this abstraction rule, 145 GL is the maximum level of groundwater abstraction per year when dam values are low, and 105 GL is the minimum level of abstraction when dam levels are high.

The short term values of water (ranging between $1.38 per kL to $1.73 per kL if 110 GL of groundwater is abstracted annually) are relatively low compared to those calculated using LRMC. This is because the model provides for demand to increase to match supply when the supply of water expands, as will be the case once the second desalination plant is constructed (expected by 2011/12). The model then provides for the price to increase as supply is held constant but demand increases.

The values of water calculated by assuming the 145-105 abstraction rule are inconsistent with the view that there is an externality cost associated with continuing to abstract groundwater at levels above 120 GL. The 145-105 abstraction scenarios result in average groundwater abstraction of around 138 GL per year over the 2010/11 to 2012/13 period.

A medium term value of water can be calculated by running the model for a longer time period, such as until 2017/18. The calculations of the medium term value of water under varying assumptions is shown in Table 2.3.

Table 2.3 Alternative Calculations of the Medium Term Value of Water (i.e. the Average Value over the Period 2010/11 to 2017/18) Real Dollars of June 2008

Groundwater Abstraction Rule (GL)	Level of Usage Charge Required to Achieve Equivalent Water Savings as Under Demand Restrictions	
	$2.00 per kL	$2.50 per kL
145 – 105 [(a)]	$0.93	$1.16
Flat 120	$1.42	$1.78
Flat 110	$1.68	$2.10

Notes: (a) For example, under this abstraction rule, 145 GL is the maximum level of groundwater abstraction per year when dam values are low, and 105 GL is the minimum level of abstraction when dam levels are high.

In conclusion, the Authority considers that a reasonable estimate of the short-term value of water is likely to range between $1.38 and $1.73 per kL for the three years of relevance to this inquiry. For the medium term, the value of water ranges between $1.68 and $2.10 per kL.

Conclusion

The Authority considers that the introduction of the second desalination plant provides an opportune time to consider changing the approach to demand management to reflect in water usage charges the short-term opportunity value of water and to place less emphasis on demand restrictions.

However, given the current uncertainty of inflows, there is little risk associated with over-pricing water, and therefore applying a long term value of water rather than a short-term value, whenever the long term value is higher, also has merit.

Using the consistent assumption that dam inflows will continue at the level experienced over the period 2001 to 2008, and adding an externality premium for groundwater abstraction, the Authority has calculated that:

- the short term value of water ranges from $1.38 per kL to $1.73 per kL;
- the medium term value of water ranges from $1.68 per kL to $2.10 per kL; and
- the LRMC ranges from $1.13 per kL to $2.57 per kL.

These values incorporate an adjustment for the externalities associated with groundwater abstraction.

On balance, the Authority considers that usage charges could range from $1.13 per kL to $2.57 per kL and could still be considered efficient. However, the Authority is inclined to not apply the upper estimate of LRMC to the majority of customers because of the sensitivity in the LRMC model to small variations in the assumption about groundwater abstraction. The range of estimates of the value of water provide scope to set usage charges in a way that minimises the social costs of any increase in usage charges. This issue will be discussed further in section 2.6.3.

Usage Charges for the Water Boards

Aqwest raised concerns about applying LRMC pricing to 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 2005/06).

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 for use elsewhere in the South West.

For example, it is conceivable that Aqwest could trade its water to Water Corporation for use in Perth, in which case the value of water in Bunbury would be the marginal cost of water in Perth 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.

For Bunbury, it is likely that the cost of transporting water to Perth is around $0.50 per kL and for Busselton the cost could be around $0.75 per kL. In other words, the value of water in Bunbury and Busselton is likely to be around $0.50 and $0.75 per kL, respectively, lower than in Perth.

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

The wide 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. The range of social considerations include:

- 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 of the charges 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 of the charges 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.

Each issue will be considered in turn.

Discounts for Essential Water Usage

As usage charges increase to reflect the value of water, an issue 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 $0.64 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.

Submissions

The Water Corporation recommends basing water usage charges for low water usage on the lower bound of long run marginal cost, which it estimates at $1.11 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.
>
> The Corporation has calculated the lower range of the LRMC to be $1.11 / kL. As this is not considered to be excessive and comparable to the $0.91 (in 2007/08 $s) currently being targeted, then no discount is proposed for non-discretionary consumption. (Water Corporation submission, p40)

Aqwest submits that its current charge for low water usage is so low that no further discounts are 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, p6)

WACOSS supports 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, 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, 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, p11)

Assessment

A discount could be applied for two reasons. The first reason is that pricing water at its value might lead to an over-recovery of revenue and an adjustment to either the fixed charge or usage charges that apply to non-discretionary usage would be considered appropriate to ensure 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 needs to be made up in some other way. 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, compared to charging a flat usage charge of, say $1.73 per kL, applying a discount of 50 per cent to water usage up to 150 kL per year would increase the annual fixed charge by $105 (from $86 to $191). Customers using less than 121 kL per year would be in a worse financial position from having the discount on water usage.[18] All residential customers using 150 kL per year or more would benefit by $24. Customers using between 121 kL and 150 kL per year would benefit by up to $24.

Another option is to fund the discount by a Community Service Obligation 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 $53 million per year for the next ten years, and increase with the population.

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 need to increase by more than 400 per cent (that is, the usage charge would need to increase from $1.73 per kL to nearly $8 per kL to maintain the annual fixed charge at $86). 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 in Perth, around 25 per cent of households have a garden bore.

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 the discount risks increasing water payments for very low water usage, 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 (their recommendation is to charge the first 150 kL at $1.11 per kL which is their 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).

[18] The 121 kL breakeven point = $105 / (0.5*$1.73).

Penalties for High Water Usage

Following the 2005 Inquiry, the Government decided to retain a tariff for usage above 950 kL per year at a level that was, at the time, 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

The Water Corporation has proposed that the usage charge be set at $2 per kL for usage above either 300 kL or 500 kL. As indicated in the Water Corporation's submission, this charge is not considered a penalty but appropriate nevertheless.

> 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, p41)

Other 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, 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, 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, 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, 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.

There is potentially an argument for 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 to, for example, provide a discount to low water using customers. There may not be any loss of efficiency from doing this (that is, if neither high nor low water using customers changed their consumption decisions as a result). However, compared to a flat usage charge of $1.73 per kL, 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 $16 per year (on average over the next ten years).[19]

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).

Overall, the Authority considers that there is little if any efficiency case for applying a penalty charge and that any equity justification is weak. 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.

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

[19] The benefit to low volume customers is a result of the annual fixed charge decreasing from $86 to $70.

> should not be used to, in effect, subsidise the water costs of property owners. (WACOSS submission, p8)

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

> 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 the move to high water usage charges would have on tenants. The Authority accepts that the impact on tenants is a concern and considers that, where all else is equal, options for setting water usage charges that minimise the impacts on tenants should be preferred to options that do not. 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, p11)

Assessment

On the basis of data from the Domestic Water Use Study, a rule of thumb is that each person uses, on average 50 kL per year, and outdoor water usage per household averages 150 kL. A large household with 6 occupants could therefore be expected to use approximately 450 kL per year.

If an inclining block tariff is warranted, then the threshold for the higher charge should be set with consideration given to large households. The Water Corporation proposed a threshold of either 500 kL per year or 300 kL per year. The Authority considers that a threshold of 500 kL per year would adequately take into account the impacts on large households.

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 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).
- A penalty charge 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

2.6.4 Conclusion

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

Water Corporation's Perth Household Customers

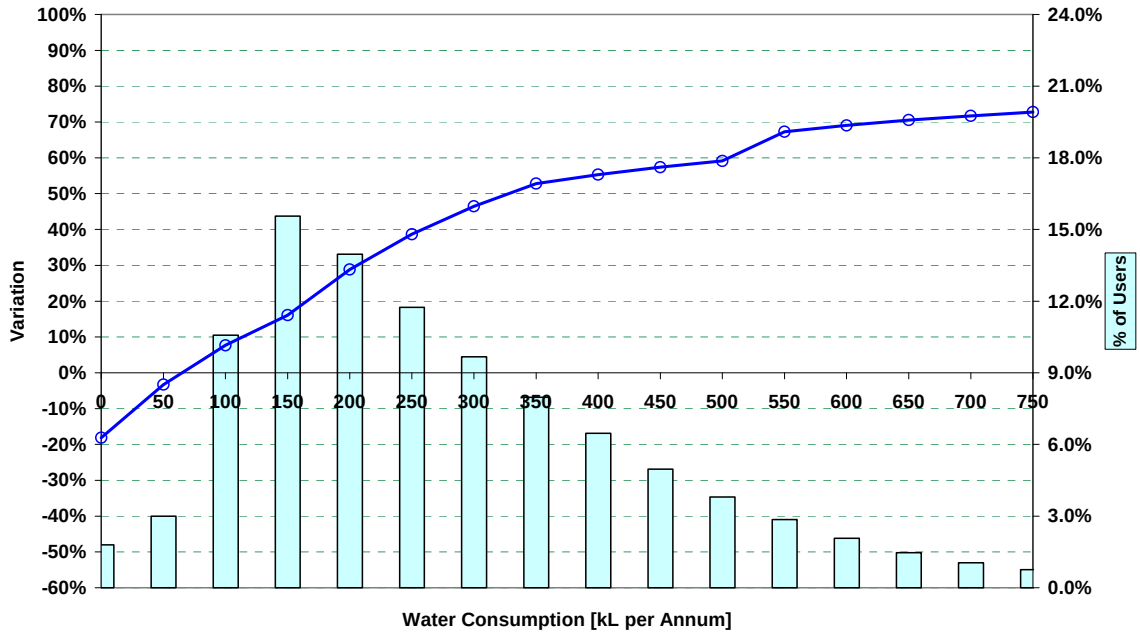
In the preceding discussion the Authority concluded that water usage charges for Perth could range from $1.13 per kL to $2.57 per kL and still be considered efficient. The Authority also concluded that it is inclined to not apply the upper estimate to the majority of customers because of the sensitivity in the LRMC model to small variations in the assumption about groundwater abstraction. In addition, the Authority established a set of guiding principles to reflect social considerations.

In applying the conclusions on the range of the value of water and the social principles above, the Authority considers that an appropriate balance would be to have:

- the lower estimate of LRMC ($1.13 per kL) apply to water usage up to 150 kL per year;
- the upper estimate of LRMC ($2.57 per kL) apply to water usage above 500 kL per year; and
- the water usage charge that applies to water usage between 150 kL and 500 kL per year be set at $1.73 per kL, which reflects the upper estimate of the short-term value of water; and
- the fixed charge be reduced to $144.

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. The figure shows that the financial impacts increase with water usage.

Figure 2.1 Preferred Option for Water Corporation's Perth Households: Percentage Increase in Water Payment from 2008/09 to 2012/13 by Water Usage



By 2012/13 the distribution of costs across users with different levels of water usage will be as shown in Figure 2.2. While high water users have the greatest increase in water payments, their payments on a per kL basis (i.e. including both the fixed charge and usage charge) will be similar to that of lower water users. Large households who use 500 kL of water usage will have the lowest payments 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)

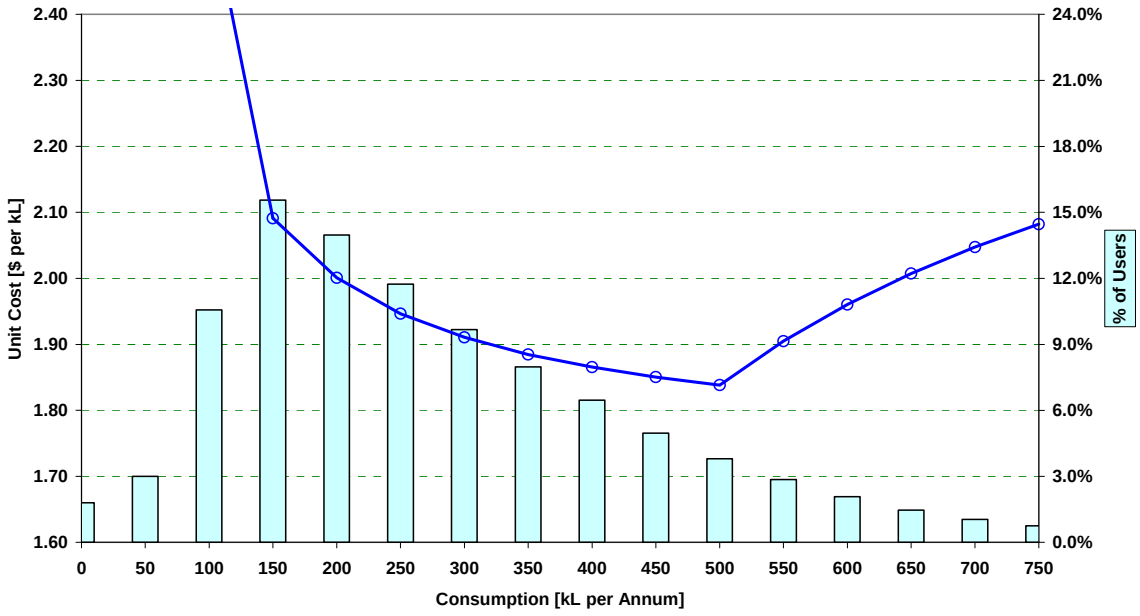
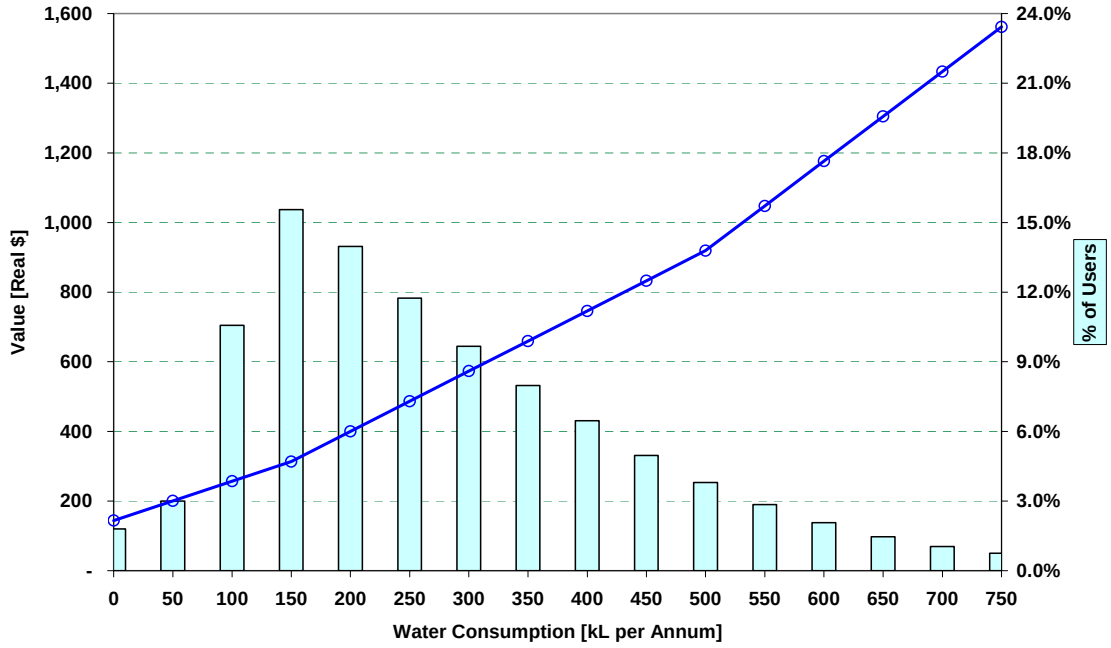


Figure 2.3 shows the relationship between the total water bill (including both usage charges and the annual fixed charge) and water usage.

Figure 2.3 Preferred Option for Water Corporation's Perth Households: Metro Water Total Payment (as at 2012/13)



By comparison, the following three figures show the impacts of other options considered by the Authority, including the Water Corporation's proposals. Option 1 in the figures is the Authority's preferred option.

- The Water Corporation's proposed option is shown as Water Corp 1 in the figure. The Authority does not consider this option is appropriate because it does not adequately account for the environmental externality associated with abstracting water from Gnangara Mound. In addition, the cost of water for low to medium water users increases significantly more than under the Authority's preferred option.
- The Water Corporation's alternative option (shown as Water Corp 2 in the figure) differs from the Authority's preferred option in that it has a lower usage charge for usage between 150 kL to 300 kL and also a lower usage charge above 500 kL. Consequently in comparison to the Authority's preferred option the financial impacts under the Water Corporation's alternative option are worse for low to medium water users and better for high water users. For this reason the Authority prefers its option.
- Another option (shown as Option 2 in the figure) has a flat usage charge (based on the upper estimate of the short-term value of water) and determines the fixed charge as the residual amount required to recover the Water Corporation's costs of providing a water service to metropolitan residential customers. In comparison to the Authority's preferred option, it results in lower payments for very low water using customers, higher payments for the majority of customers, and lower payments for high water using customers. On balance, the Authority prefers its option.

Figure 2.4 Tariff Options for Water Corporation's Perth Households: Percentage Increase in Water Payment from 2008/09 to 2012/13 by Water Usage (Real Dollars of June 2008)

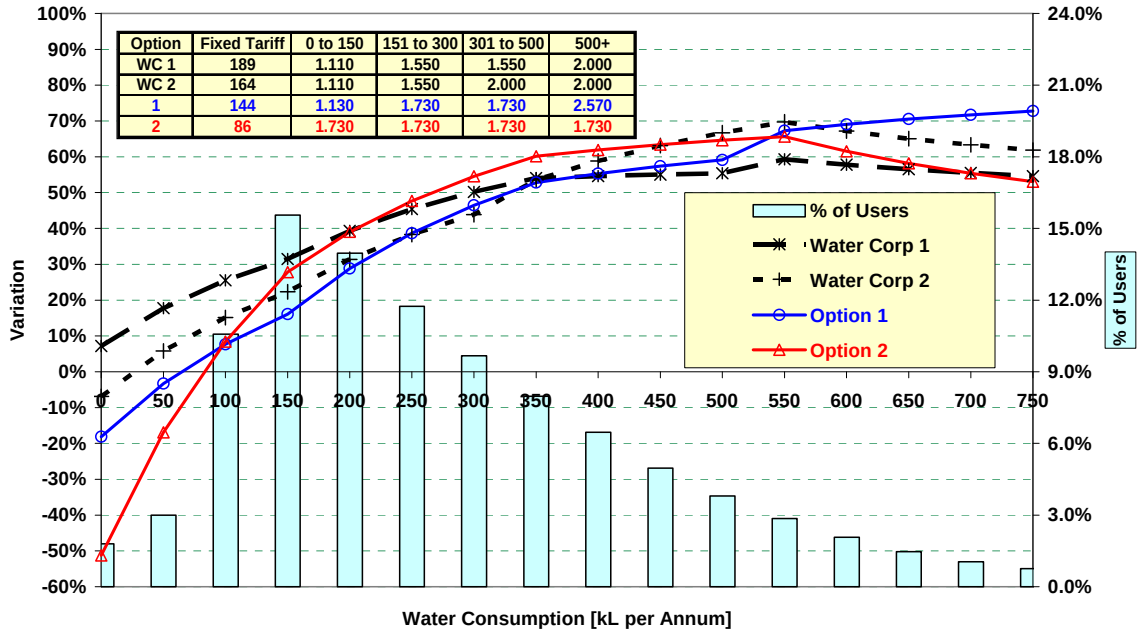


Figure 2.5 Tariff Options for Water Corporation's Perth Households: Average Cost per kL by Water Usage (as at 2012/13, Real Dollars of June 2008)

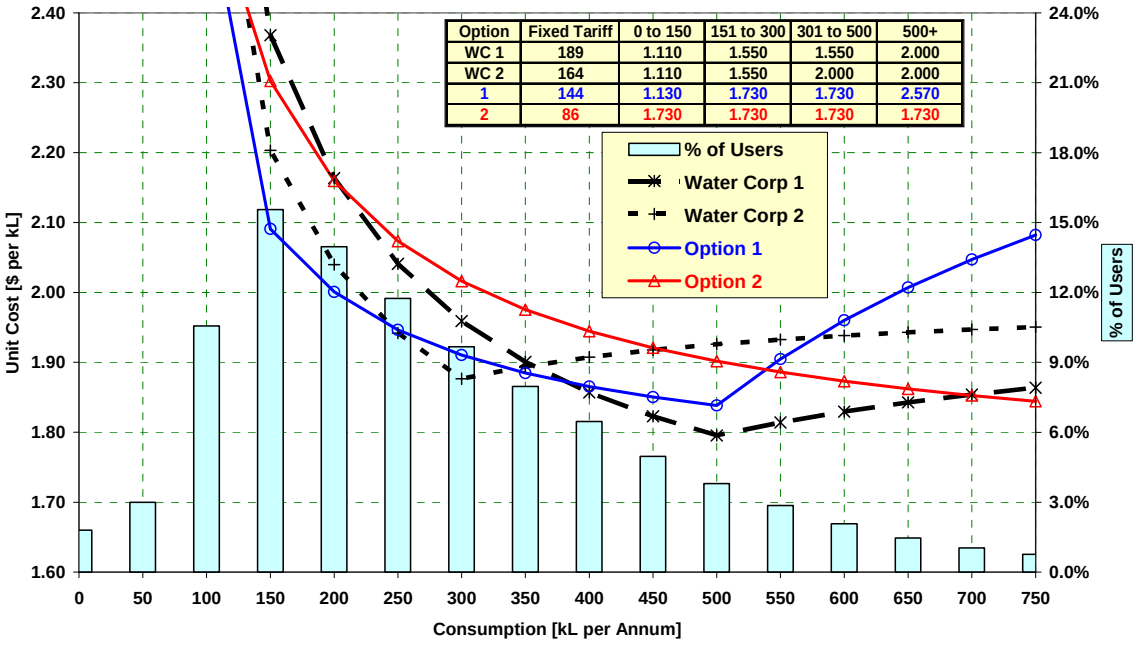
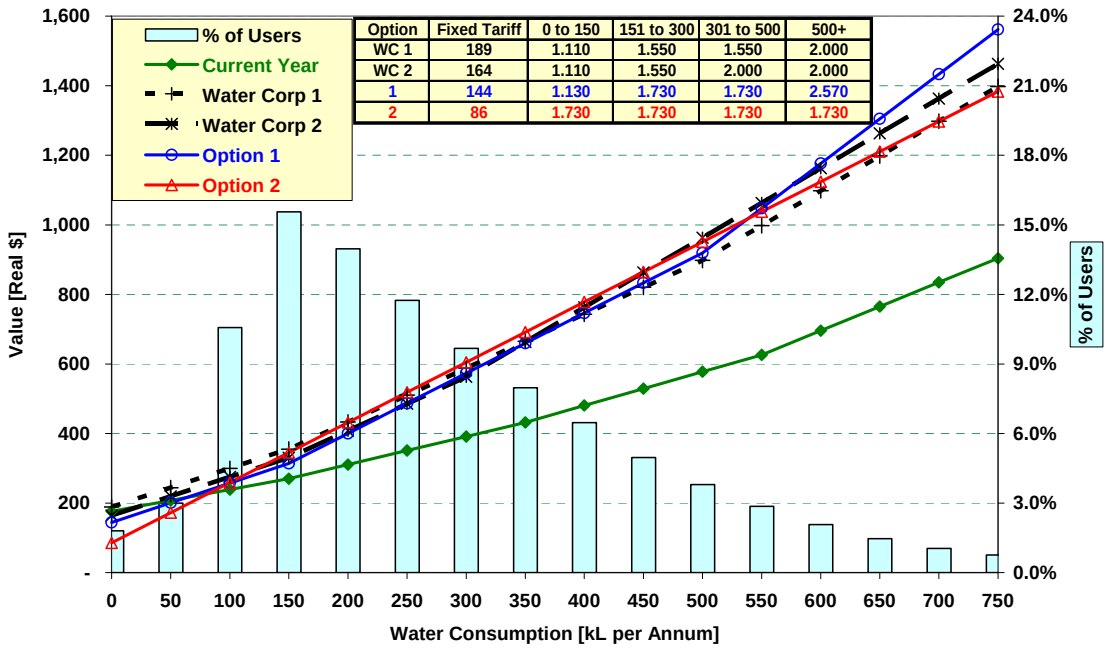


Figure 2.6 Tariff Options for Water Corporation's Perth households: Metro Water Total Payment (as at 2012/13, Real Dollars of June 2008)



Transition Issues

The level of water payment increases described above may cause significant financial impacts on some customers. Table 2.4 shows the impact of alternative transitions on metropolitan customers using 250 kL per year.

Table 2.4 Impacts on Metropolitan Customers using 250 kL per Year (not Tenants or Concession Card Holders, Real Dollars of June 2008)

	Variation in Total Water Payment
Immediate transition	+$118 by 2010/11
Transition over period to 2012/13	+$136 spread over four years (+$34 per year)
Transition over ten years	+$219 spread over ten years (+$22 per year)

In coming to a view about the appropriate length of the transition period the Authority has weighed the annual financial impacts on customers against the efficiency gains associated with having customers pay a usage charge that reflects the value of water.

In addition, the Authority notes that the Government decided to transition the move to LRMC pricing over an eight year period (ending in 2013/14). It is understood that the main reason for the transition was the impact on tenants, who would be impacted by a rebalancing of usage charge and fixed charge, because they would pay the higher usage charge but in most circumstances the lower fixed charge would be retained by the landlord. The Authority's proposal does involve a $35 reduction in the fixed charge tenants are unlikely to benefit from. However, the Authority's proposal also involves retaining a lower usage charge for the first 150 kL of water usage (whereas previously the Authority had advised not to have this lower charge), which tenants will benefit from.

Overall, the Authority considers that the size of the increase in water payments for residential customers warrants a transition and that the transition should be completed by the last year of the regulatory period, i.e. 2012/13. For commercial customers, the Authority considers that there are no social reasons to defer the immediate introduction of the higher usage charge.

Summary

Overall, the Authority's draft recommendation is that water usage charge for Perth households should be set at $1.13 per kL up to 150 kL, $1.73 per kL from 151 kL to 500 kL, and $2.57 per kL above 500 kL. The new charges should be phased-in over the period to 2012/13. For commercial customers in Perth, the usage charge should be immediately set at $1.73 per kL.

Aqwest's Household Customers

For Aqwest's household customers, the Authority's starting point for consideration was to have the water usage charges set at a discount below each of the Perth water usage charges, with the discount reflecting the cost of transporting water to Perth (the transportation cost has been assumed to be $0.50 per kL). In addition, the Authority considered the option of retaining the current usage charges.

The two scenarios are shown in Table 2.5.

Table 2.5 Current Water Usage Charges for Aqwest (2009/10) Compared with the Authority's Proposed Charges (Real Dollars of June 2008)

Consumption (kL per Annum)	Water Usage Charges ($ per kL)	
	Current Aqwest Charges (2008/09)	Authority's Proposed Charges
Commercial Customers		
0-1,000	0.65	1.23
> 1,000	0.97	1.23
Residential Customers		
0-150	0.41	0.63
151-300	0.75	1.23
301-350	1.06	1.23
351-500	1.40	1.23
501-700	1.40	2.07
701-1,000	1.68	2.07
> 1,000	2.47	2.07
Residential Fixed Charge ($ per Annum)	96.72	36.41

The financial impact of these two scenarios are presented in the following three figures.

Figure 2.7 and Figure 2.8 show the increase in water payments for Aqwest residential customers from 2008/09 to 2012/13 by annual water usage, as a percentage and in real dollar terms. The figures show that residential customers using less than 200 kL per year would have a reduction in their water payments, compared with the current tariff structure, while residential customers using more than 200 kL per year would have an increase in their water payments.

Figure 2.7 Tariff Options for Aqwest's Households: Percentage Increase in Water Payment from 2008/09 to 2012/13 by Water Usage (Real Dollars of June 2008)

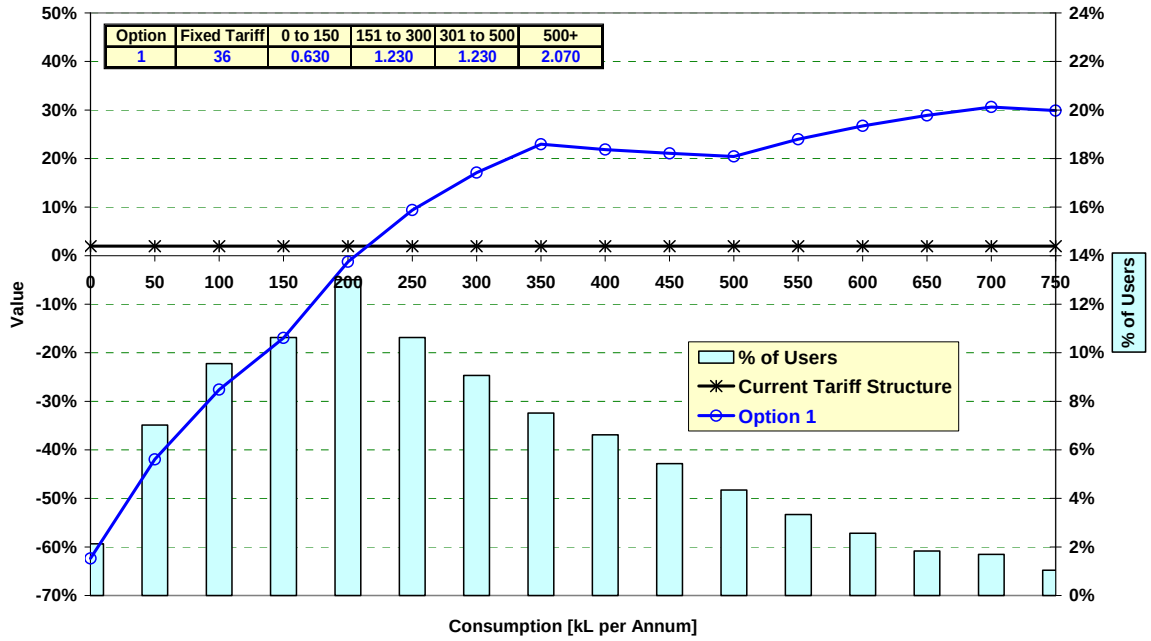


Figure 2.8 Tariff Options for Aqwest's Households: Total Payment by Water Usage (as at 2012/13) Real Dollars of June 2008

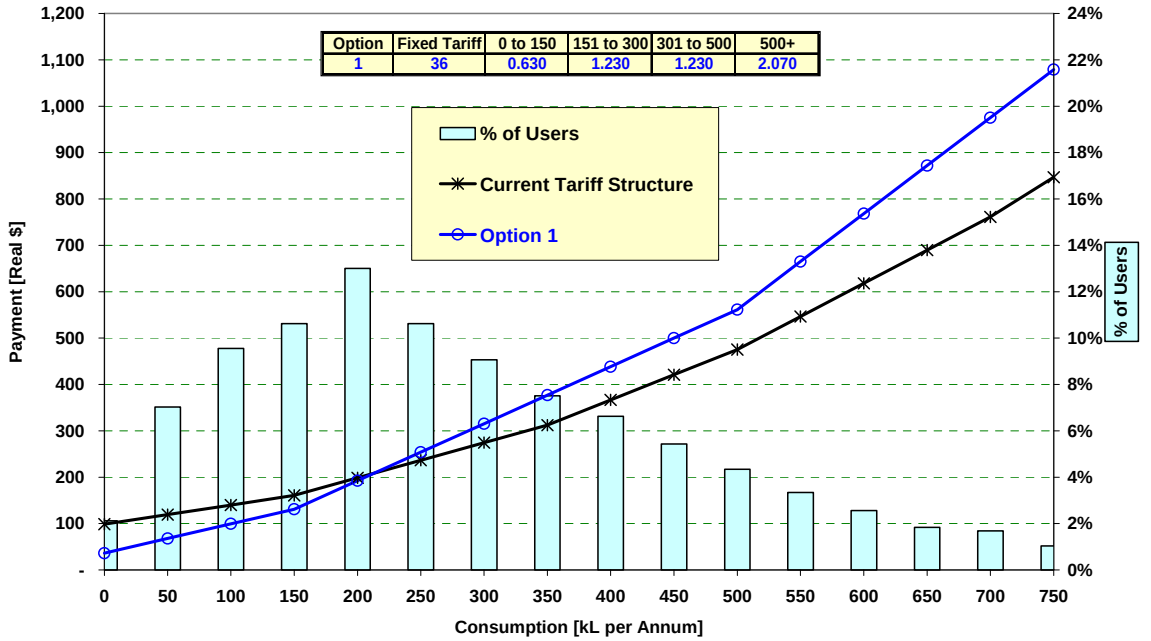
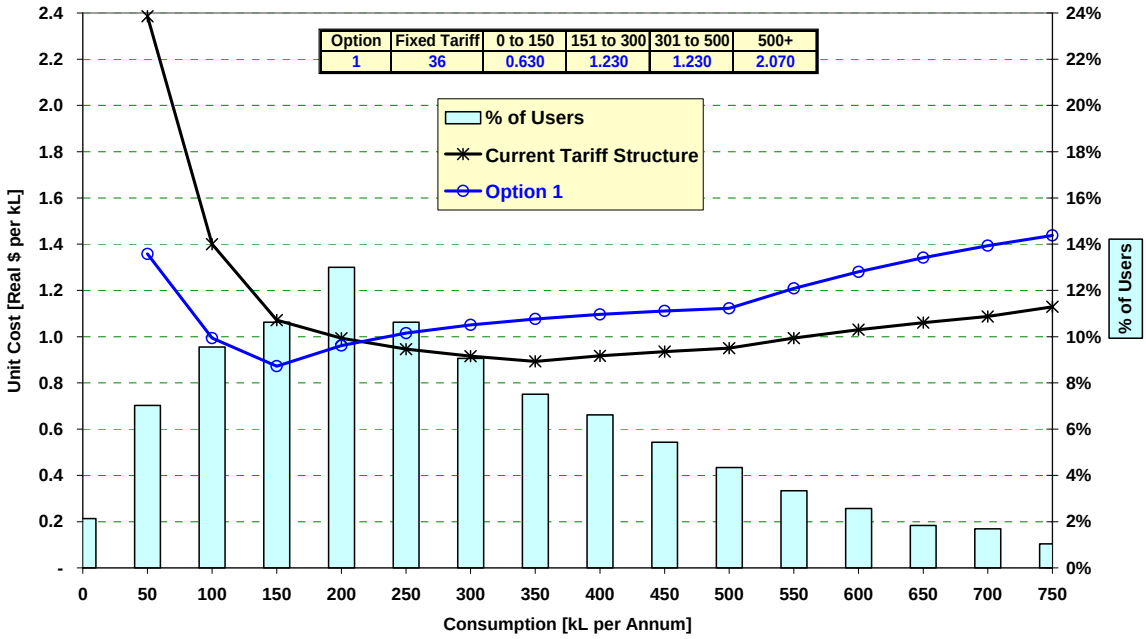


Figure 2.9 shows that the average cost of water would generally increase with water usage.

Figure 2.9 Tariff Options for Aqwest's Households: Average Cost per kL by Water Usage (as at 2012/13) Real Dollars of June 2008



The Authority considers that its preferred option should be phased-in by 2012/13.

Busselton Water's Household Customers

For Busselton Water's household customers, the Authority's starting point for consideration was to have the water usage charges set at a discount below each of the Perth water usage charges, with the discount reflecting the cost of transporting water to Perth (the transportation cost has been assumed to be $0.75 per kL).

Table 2.6 Current Water Usage Charges for Busselton Water (2009/10) Compared with the Authority's Proposed Charges (Real Dollars of June 2008)

Consumption (kL per Annum)	Water Usage Charges ($ per kL)	
	Current Busselton Water Charges (2008/09)	Authority's Proposed Charges
Commercial Customers		
0-1,000	0.68	0.98
> 1,000	0.98	0.98
Residential Customers		
0-150	0.45	0.38
151-350	0.63	0.98
351-500	0.69	0.98
501-550	0.69	1.82
551-750	0.83	1.82
751-1,150	1.38	1.82
1,150-1,550	1.96	1.82
1,551-1,950	2.27	1.82
> 1,950	2.64	1.82
Residential Fixed Charge ($ per Annum)	112.37	34.45

The financial impacts of this scenario are presented in Figure 2.10 and Figure 2.11. The figures show the increase in water payments from 2008/09 to 2012/13 by annual water usage, as a percentage and in real dollar terms. The figures show that residential customers using less than 400 kL per year would have a reduction in their water payments, compared to the current tariff structures, while residential customers using more than 400 kL per year would have an increase in their water payments.

Figure 2.10 Tariff Options for Busselton Water's Households: Percentage Increase in Water Payment from 2008/09 to 2012/13 by Water Usage (Real Dollars of June 2008)

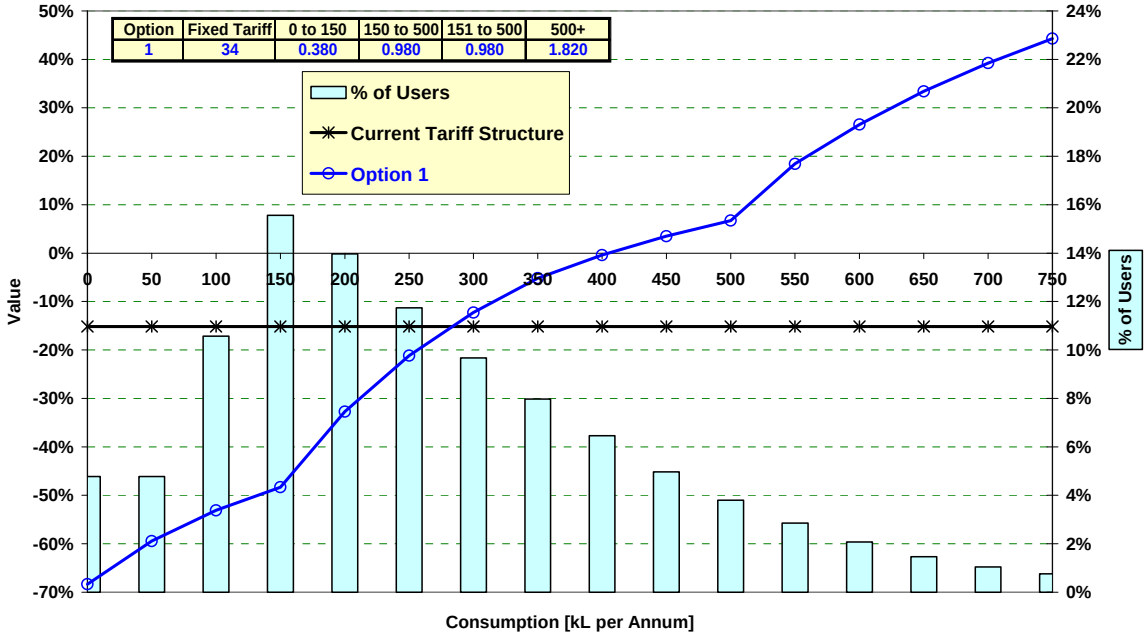


Figure 2.11 Tariff Options for Busselton Water's Households: Total Water Payment by Water Usage (as at 2012/13), Real Dollars of June 2008

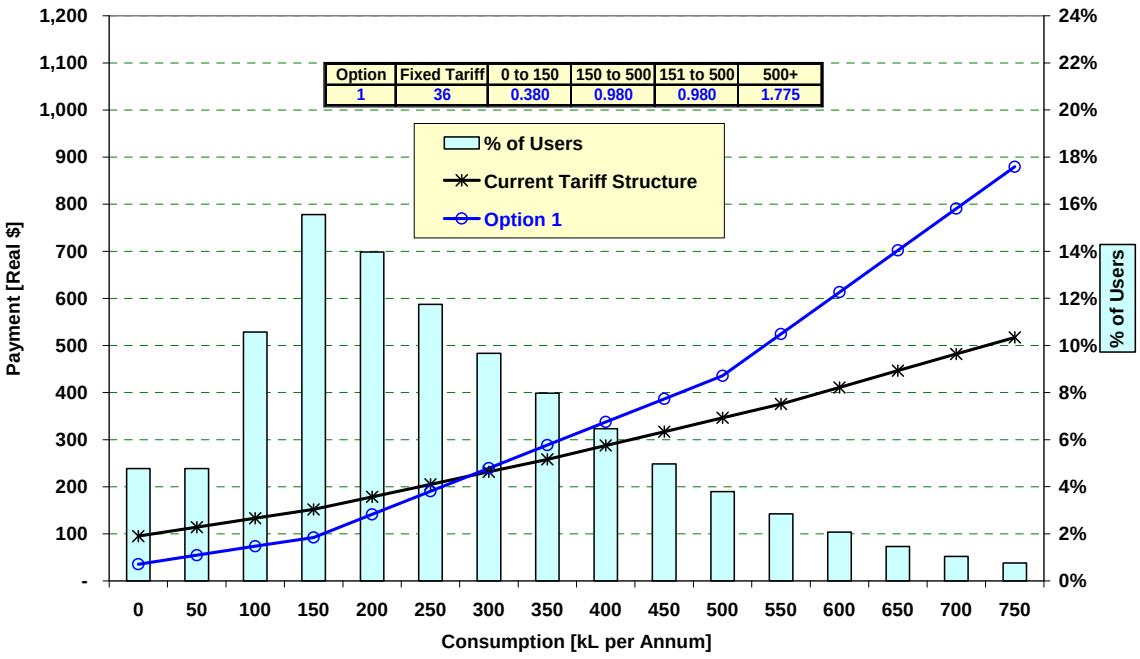
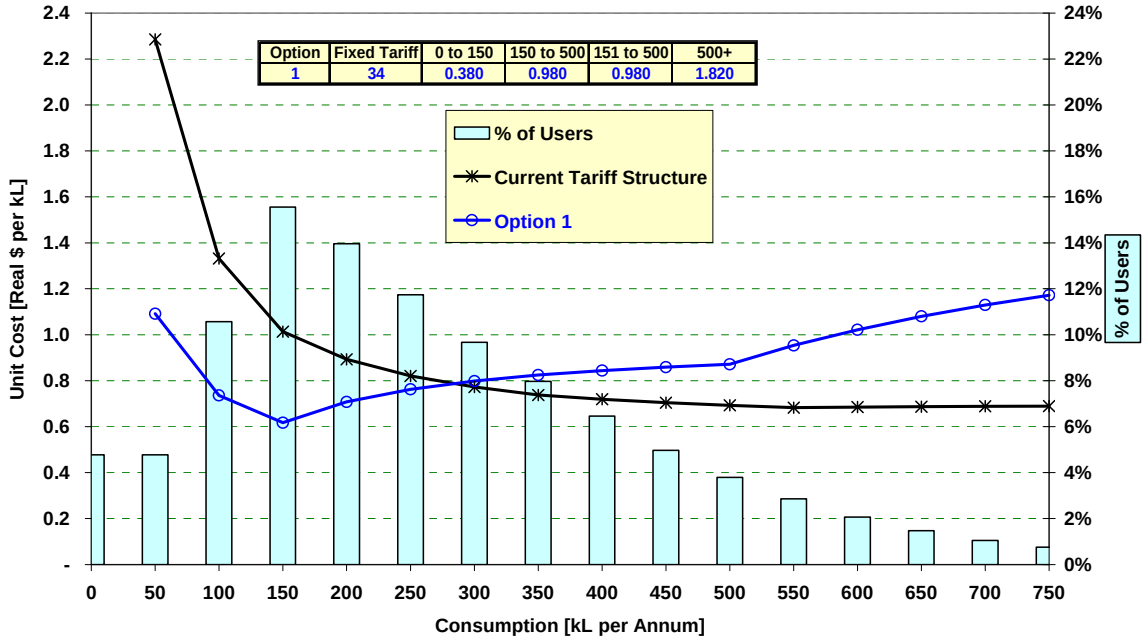


Figure 2.12 shows that once the proposed tariffs are fully implemented the average cost of water would generally increase with water usage.

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 2008



The Authority considers that its preferred option should be phased-in by 2012/13.

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 Draft Recommendations

Draft Recommendations

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

6) For the purpose of calculating residential water usage charges, country towns be classified into 15 groups with the classification based on the relative cost of providing the water service to each town.

3.3 Reasons

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 increased significantly. 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.

Under a tariff cap policy, it is important to distinguish towns that have lower costs than Perth from towns that have higher costs than Perth. With this purpose in mind, the Authority's draft recommendation is that the current approach of classifying towns into 5 groups should be modified so that the classification is into 15 groups. This would make the grouping of towns for residential charging purposes consistent with the grouping for non-residential charging purposes. It would also reduce the impacts on customers whenever towns are reclassified between groups (for example, if costs increase).

The Authority also considers that there is merit in considering a reduction in the uniform tariff threshold. It 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 draft recommendation on this matter in this report but is interested in receiving submissions on the issue.

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 previously.

- 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.[20]
- 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).[21] These thresholds have been reduced by 50 kL.
- 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.[22]
- 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 for non-residential country customers are the same as for non-residential metropolitan customers.

3.5 Submissions

Given the recently commenced implementation of significant changes to country water charges, the Water Corporation submitted that only one reform to country prices be considered at this time: a reduction in the uniform pricing threshold.

> Marginal cost water usage charges are appropriate for sending pricing signals for the efficient use of water. However, basing usage charges on marginal cost could result in considerable increases in country towns where the cost of future sources may be very high.
>
> Furthermore, there are significant administrative costs required to determine the marginal cost for each scheme which is further complicated by the uncertainties inherent in any approach that seeks to forecast future events.

[20] 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).

[21] "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.

[22] 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.

> For these reasons, marginal pricing in country schemes is only warranted in limited circumstances. The Corporation applies the approach for major commercial and industrial customers, with charges based on the cost of scheme augmentation.
>
> For the remaining regulated customer base, the Government has recently made the decision (in early 2008) to base country charges on the average cost of existing sources. The Corporation supports this decision and would prefer to see the current reforms phased-in prior to reopening the discussion on what is an appropriate pricing approach.
>
> Charges based on a scheme's average cost (or the average cost of a group of schemes) still allows for some distinction in prices based on the cost of providing the service, but removes much of the administrative burden (and possible pricing volatility) that would result with marginal pricing. (Water Corporation submission, p39)
>
> The Corporation considers either of two options for the uniform pricing threshold to be reasonable, being:
>
> 3) 300 kL (current threshold) roughly based on the average annual household water usage; or
>
> 4) 150 kL per household, based on the average non-discretionary household water usage.
>
> Any departure from the current threshold is a decision for the Government. In general, a lowering of the threshold will remove part of the current discount given to country customers, thereby increasing the total charge to them. This social impact should be weighed against the potential benefits of sending an efficient pricing signal. (Water Corporation submission, p40)

The Department of Treasury and Finance supported the consideration of marginal cost pricing in country areas:

> A pricing structure similar to the Perth metropolitan area using marginal cost pricing should be considered for country areas. In developing such options, consideration will need to be given to those towns where the growth rate is minimal or approaching zero and the marginal cost of water supply is therefore quite low. In these instances it may be appropriate to consider alternate charging mechanisms that at least cover the operating and maintenance costs of water service provision, to ensure the ongoing supply of water is maintained. (Department of Treasury and Finance submission, p7)

The Department of Water and the Department of Treasury and Finance noted that the uniform price, if applied to the country, could result in some lower cost country towns having to pay more than the costs of providing the services.

> **Department of Water**
>
> Where country towns have lower supply costs than Perth, it is important that this be reflected in charges as far as practicable. If country prices only reflect costs when these are higher than Perth, this could create a perception of unfairness against country areas. (Department of Water submission, p5)

> **Department of Treasury and Finance**
>
> The link between the prices in the Perth metropolitan area and country areas via the uniform pricing policy (UPP) and the potential for over-charging in those country areas is acknowledged. Therefore, the consideration by the ERA of alternative pricing structures that avoid such over-charging but deliver cost reflective pricing to country areas is welcomed. Such a balance of objectives, together with that of ensuring affordable water to those least able to afford it, would be readily achievable under the targeted social policy approach proposed earlier. (Department of Treasury and Finance submission, p6)

The Department of Treasury and Finance submitted that the social objectives underpinning the uniform pricing policy might be better achieved through targeted subsidies.

> 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)

3.6 Assessment

Submissions have requested the Authority consider the following issues:

- Replacement of the uniform pricing policy with a "tariff cap policy", which provides for low costs towns to pay a lower usage charges than would occur under the uniform pricing policy (Department of Water and Department of Treasury and Finance).
- The 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).

The Authority has considered each issue in turn.

3.6.1 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.

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, and with the higher metropolitan usage charges, the usage charges in the country would eventually be phased-in to the charges shown in Table 3.1. 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).

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 2008

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Class 1	1.13	1.73	1.73	1.73	1.73
Class 2	1.13	1.73	1.73	1.73	1.73
Class 3	1.13	1.73	1.73	1.73	1.73
Class 4	1.13	1.73	1.86	2.23	2.60
Class 5	1.13	1.73	2.93	4.13	5.33

However, cost-reflective charges for water usage above 300 kL in Classes 1 through 3 will be lower than $1.73 per kL, and for Class 1 significantly lower. In Table 3.2, the usage charges above the uniform pricing threshold are set to be cost reflective after taking into account the revenue received from the uniform prices (both fixed and usage charges). Even by charging as little as $0.30 per kL for water usage above 300 kL, customers in Class 1 would be paying more than the cost of the water service (the annual overpayment by Class 1 customers would be $10.7 million in 2012/13).

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 2008

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Class 1	1.13	1.73	0.30	0.30	0.30
Class 2	1.13	1.73	0.62	0.62	0.62
Class 3	1.13	1.73	1.20	1.23	1.26
Class 4	1.13	1.73	1.86	2.23	2.60
Class 5	1.13	1.73	2.93	4.13	5.33

To remove the anomalies of having customers in some towns paying more than the cost of the service, and having usage charges decline as water usage increases, it would be appropriate to reduce 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 grouping of towns could be done on the basis of 15 groups rather than 5. This would make the grouping of towns for residential charging 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 5 groups.

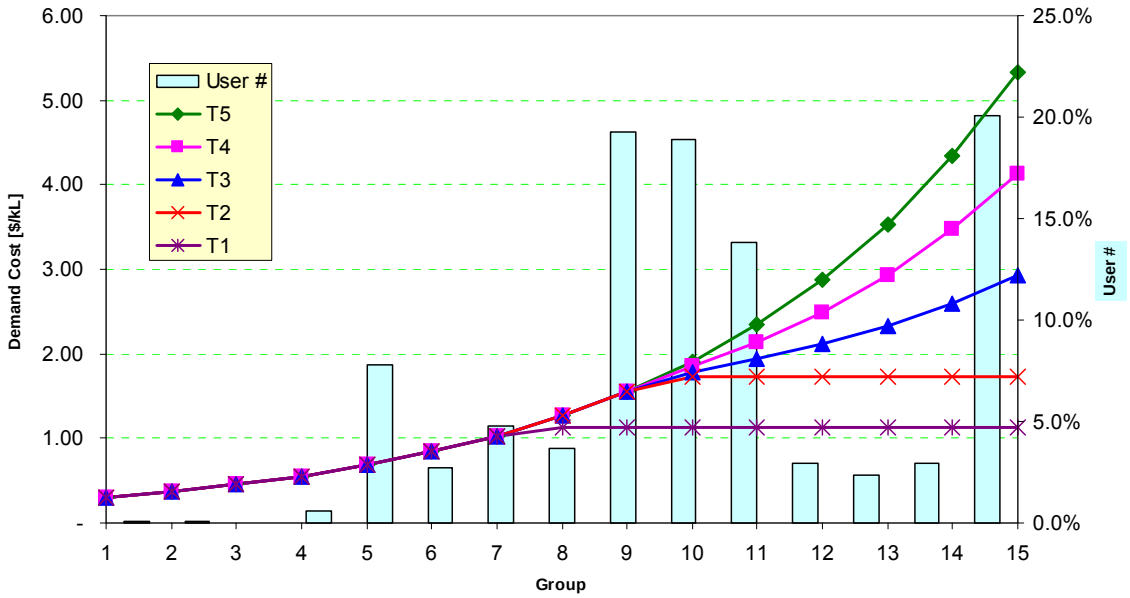
Suggested usage charges for each group are shown in Table 3.3. The usage charge for group 1 is set in order to remove the overpayment by that group.

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 2008

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Group 1	0.30	0.30	0.30	0.30	0.30
Group 2	0.37	0.37	0.37	0.37	0.37
Group 3	0.45	0.45	0.45	0.45	0.45
Group 4	0.56	0.56	0.56	0.56	0.56
Group 5	0.68	0.68	0.68	0.68	0.68
Group 6	0.84	0.84	0.84	0.84	0.84
Group 7	1.03	1.03	1.03	1.03	1.03
Group 8	1.13	1.26	1.26	1.26	1.26
Group 9	1.13	1.55	1.55	1.55	1.55
Group 10	1.13	1.73	1.79	1.85	1.91
Group 11	1.13	1.73	1.93	2.14	2.34
Group 12	1.13	1.73	2.11	2.50	2.88
Group 13	1.13	1.73	2.33	2.93	3.54
Group 14	1.13	1.73	2.60	3.47	4.34
Group 15	1.13	1.73	2.93	4.13	5.33

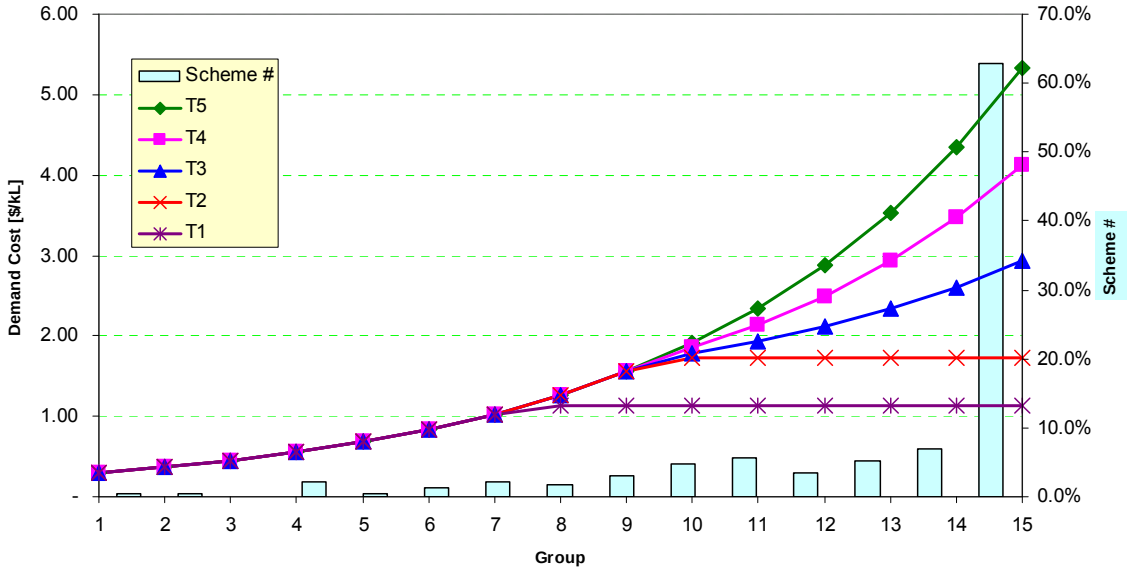
The data in Table 3.3 can also be shown graphically along with the number of customers within each group, as in Figure 3.1. The lines in Figure 3.1 show the five tiers of usage charges within each group. However, for groups 1 through 7, there is a flat usage charge; for groups 8 and 9 there are two tiers of usage charges, while for groups 10 through 15 there are five tiers of usage charges. The columns in Figure 3.1 show the percentage of country residential water customers within each group.

Figure 3.1 Residential Tariffs for Country Towns in the South under a Tariff Cap Policy and Distribution of Customers across Groups, Real Dollars of June 2008



While the distribution of customers is spread as shown above, the greatest number of towns are in group 15, 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 2008



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 uniform pricing policy should be changed to a “tariff cap policy”.

3.6.2 Reduction in the Uniform Pricing Threshold

An issue 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 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 amounts 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. "Optimal access" is defined by the WHO as 100 litres per capita per day and above, supplied through multiple taps continuously.[23] 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 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.[24] This quantity is equivalent to an annual per capita 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, is shown in Table 3.4.

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

[24] 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 3.4 Residential Usage Charges for Country Towns in the South under the Tariff Cap Policy with a Threshold of 150 kL (Real Dollars of June 2008)

	Usage (kL / year)				
Town	1-150	151-300	301-550	551-950	951+
Group 1	0.30	0.30	0.30	0.30	0.30
Group 2	0.37	0.37	0.37	0.37	0.37
Group 3	0.45	0.45	0.45	0.45	0.45
Group 4	0.56	0.56	0.56	0.56	0.56
Group 5	0.68	0.68	0.68	0.68	0.68
Group 6	0.84	0.84	0.84	0.84	0.84
Group 7	1.03	1.03	1.03	1.03	1.03
Group 8	1.13	1.16	1.20	1.23	1.26
Group 9	1.13	1.24	1.34	1.45	1.55
Group 10	1.13	1.32	1.52	1.71	1.91
Group 11	1.13	1.43	1.74	2.04	2.34
Group 12	1.13	1.57	2.00	2.44	2.88
Group 13	1.13	1.73	2.33	2.93	3.54
Group 14	1.13	1.93	2.74	3.54	4.34
Group 15	1.13	2.18	3.23	4.28	5.33

The impact on customers is shown in Table 3.5. It can be seen that the reduction in the threshold reduces payments for groups 8 to 12 and increases payments for groups 14 and 15. The reduction for groups 8 to 12 is caused by an assumption that the tariff increases from the threshold to tier 5 are spread evenly. For example, for group 8, the dollar increase from tier 1 (the tariff at the new threshold) to tier 2 ($0.03) 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.[25]

The increase for groups 14 and 15 Table 3.5 is caused by the tariffs above the uniform pricing threshold being higher than would otherwise apply.

As a result of the positive and negative impacts on customers, CSO payments are not impacted significantly (the CSO changes by less than $1 million).

[25] An alternative assumption could be to have the tariffs increase in equal increments from tier 1 to tier 5, with the tariffs being subject to the tariff cap below the threshold. However, this alternative assumption would significantly reduce the tariffs in Table 3.3 and significantly increase the CSO. Table 3.3 would become the same as Table 3.4 (as it currently is) with the exception that groups 14 and 15 would have the second tier tariff set to $1.73. Table 3.4 would be unchanged.

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 2008)

	Usage (kL / year)					
	100	200	300	400	500	600
Group 1	-	-	-	-	-	-
Group 2	-	-	-	-	-	-
Group 3	-	-	-	-	-	-
Group 4	-	-	-	-	-	-
Group 5	-	-	-	-	-	-
Group 6	-	-	-	-	-	-
Group 7	-	-	-	-	-	-
Group 8	-	-5	-15	-22	-29	-34
Group 9	-	-16	-48	-69	-90	-106
Group 10	-	-20	-61	-88	-115	-135
Group 11	-	-15	-44	-64	-84	-99
Group 12	-	-8	-24	-35	-46	-54
Group 13	-	0	0	0	0	0
Group 14	-	10	30	44	58	68
Group 15	-	23	68	98	128	150

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 2008)

	Usage (kL / year)				
Town	1-150	151-250	251-550	551-950	951+
Group 1	0.30	0.30	0.30	0.30	0.30
Group 2	0.37	0.37	0.37	0.37	0.37
Group 3	0.45	0.45	0.45	0.45	0.45
Group 4	0.56	0.56	0.56	0.56	0.56
Group 5	0.68	0.68	0.68	0.68	0.68
Group 6	0.84	0.84	0.84	0.84	0.84
Group 7	1.03	1.03	1.03	1.03	1.03
Group 8	1.13	1.26	1.26	1.26	1.26
Group 9	1.13	1.55	1.55	1.55	1.55
Group 10	1.13	1.73	1.79	1.85	1.91
Group 11	1.13	1.73	1.93	2.14	2.34
Group 12	1.13	1.73	2.11	2.50	2.88
Group 13	1.13	1.73	2.33	2.93	3.54
Group 14	1.13	1.73	2.60	3.47	4.34
Group 15	1.13	1.73	2.93	4.13	5.33

The financial impacts of lowering the threshold to 250 kL would be as shown in Table 3.7. All customers are either not impacted or are worse off. However, the impacts on group 15 are significantly reduced.

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
Group 1	-	-	-	-	-	-
Group 2	-	-	-	-	-	-
Group 3	-	-	-	-	-	-
Group 4	-	-	-	-	-	-
Group 5	-	-	-	-	-	-
Group 6	-	-	-	-	-	-
Group 7	-	-	-	-	-	-
Group 8	-	-	-	-	-	-
Group 9	-	-	-	-	-	-
Group 10	-	-	3	3	3	3
Group 11	-	-	10	10	10	10
Group 12	-	-	19	19	19	19
Group 13	-	-	30	30	30	30
Group 14	-	-	44	44	44	44
Group 15	-	-	60	60	60	60

Overall, the Authority considers that there are grounds for reducing the threshold to 150 kL in order to target the CSO to essential water usage. However, the financial impacts on some households in groups 14 and 15 are significant.

3.6.3 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.

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

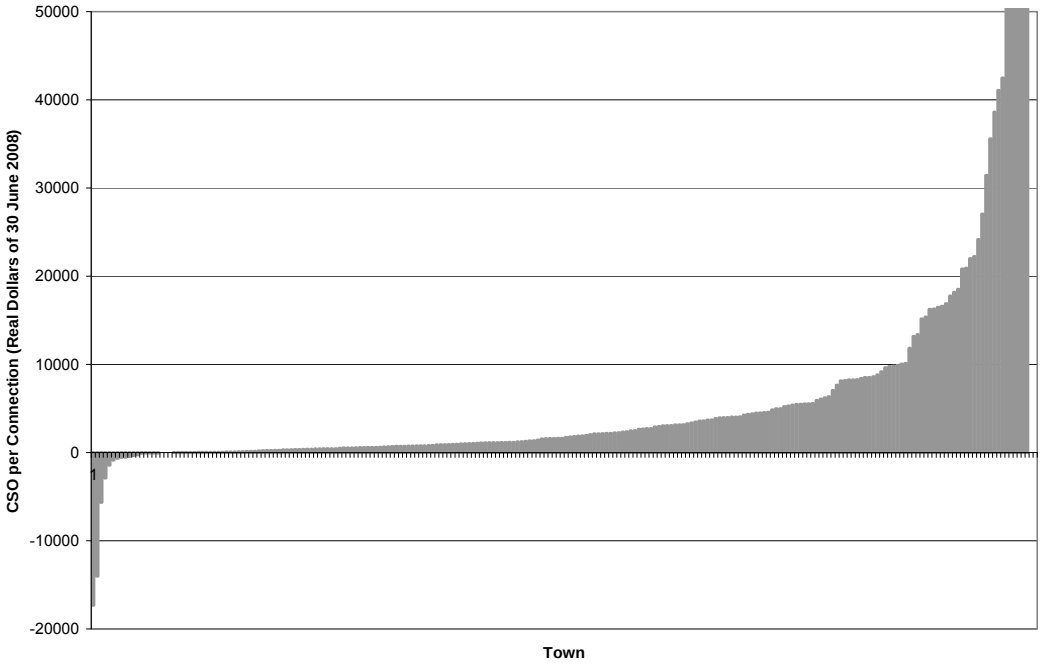
- It benefits residences in the north and south of the State (the uniform pricing threshold is higher in the North by 200 kL).
- The subsidy starts to abate once a customer uses more than the uniform pricing threshold (usage charges are more cost reflective above the threshold).

The Authority does not consider it to be within the scope of this project to identify an alternative mechanism to provide targeted subsidies. The Authority has considered, however, the Department of Treasury and Finance's proposal to not deliver subsidies 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 very high (e.g. more than $5,000 per year). Figure 3.3 shows the distribution of CSO per customer across the country towns. Towns with the highest CSO per connection are generally towns with relatively few connections.

Figure 3.3 Average CSO per Connection across Country Towns



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 cover the 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 above for tier 5 with the cap for Group 15 continuing to apply).

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 Group 15), Real Dollars of June 2008

Town	Flat Usage Charge
Group 1	0.30
Group 2	0.37
Group 3	0.45
Group 4	0.56
Group 5	0.68
Group 6	0.84
Group 7	1.03
Group 8	1.26
Group 9	1.55
Group 10	1.91
Group 11	2.34
Group 12	2.88
Group 13	3.54
Group 14	4.34
Group 15	5.33

Compared to applying tariffs consistent with a "tariff cap policy", the impacts on customers in groups 8 to 15 would be substantial, as is shown in Table 3.9.

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 Group 15), Real Dollars of June 2008

	Usage (kL / year)					
	100	200	300	400	500	600
Group 1	-	-	-	-	-	-
Group 2	-	-	-	-	-	-
Group 3	-	-	-	-	-	-
Group 4	-	-	-	-	-	-
Group 5	-	-	-	-	-	-
Group 6	-	-	-	-	-	-
Group 7	-	-	-	-	-	-
Group 8	7	13	13	13	13	13
Group 9	21	42	42	42	42	42
Group 10	39	87	105	116	128	137
Group 11	61	152	213	254	295	326
Group 12	87	232	347	424	500	558
Group 13	120	331	511	632	752	842
Group 14	161	452	713	887	1,062	1,192
Group 15	210	601	961	1,201	1,441	1,622

Overall, the Authority considers that if the Government is interested in exploring 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 need to be offset in some way. It would also result in water usage charges that in many circumstances would be higher than the long run marginal cost.

3.6.4 Conclusion

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 increased significantly. 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 there is merit in considering a reduction in the uniform tariff threshold. The Authority will take into account submissions on this matter in the preparation of the final report.

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 Draft Recommendations

Draft Recommendations

7) Residential wastewater charges be no longer based on property values but instead be based on estimated winter water usage, which is a reasonable proxy for discharge into the sewer.

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

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

4.3 Reasons

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 favours basing wastewater charges on estimated winter water usage. Generally, water usage in winter is for indoor purposes as there is less need to use sprinklers during winter. The wastewater discharged in winter is likely to be directly related to the amount of water used in winter (whereas during other months this is unlikely to be true). Basing wastewater bills on winter water usage is therefore likely to be the most cost-reflective approach to setting wastewater charges. It would require the Water Corporation to move to quarterly billing, which it is understood is currently being considered. It is possible that this alternative approach could not be implemented by 1 July 2010, which is the date from which the tariff recommendations from this inquiry, if adopted, would apply. It may therefore be appropriate to apply a flat charge for the first year of the three year pricing period or until such time as the new approach could be implemented. A transition period of at least three years is then likely to be required to minimise the financial impacts on customers (particularly for customers currently in relatively low valued properties).

The following discussions is separated into residential wastewater charging issues and non-residential wastewater charging issues.

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. [26] 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 2005/06 is $275.90 per residential unit and the maximum charge is $687.50.

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.[27]

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 Submissions

The Water Corporation, Department of Treasury and Finance and other submissions strongly support a move away from GRV-based pricing for residential wastewater charges:

> **Water Corporation**
>
> The Corporation strongly supports decoupling residential wastewater charges from property values predominately because GRV based charges are administratively cumbersome and difficult to explain to customers who complain that they bear no relationship to the cost of providing the service. (Water Corporation submission, p42)

[26] *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.

[27] 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.

Department of Treasury and Finance

The separation of residential wastewater charges and property values (value based charges) is strongly supported because of the considerable variation in prices charged, compared to the highly consistent level of services received. (Department of Treasury and Finance submission, p7)

D. Wettenhall

It would be preferable for water charges to reflect the value of the water rather than the land value. This will result in more efficient allocation of resources to service the water supply and disposal requirements of communities. (D. Wettenhall submission, p1)

The submission by D. Wettenhall illustrates the difficulty that customers face in understanding their wastewater bills, due to the lack of any link between the costs of service provision and charges.

It is grossly unfair that rural communities such as Albany are rated at 185% higher marginal rate than metropolitan areas. Water Corporation says it is more costly to service Albany. This could only be a result of:

- Metropolitan sewers having been fully amortized while Albany is still being developed
- Un-costed ocean pollution by metropolitan sewerage outfalls

There are many reasons why Albany's sewerage system should be cheaper than metropolitan Perth because of lower land costs and a cost effective, low pollution land disposal system for treated water. This is confirmed in the ERA Issues Paper wherein Figures 3.1 and 3.2 indicate that the cost of operating the Perth water and sewerage scheme is approximately $390/property versus $250/property in Albany. (D. Wettenhall submission, p1)

The Department of Treasury and Finance noted that property-based prices for wastewater services could result in a distortion to access prices if a State-based third party access regime were to be introduced.

Department of Treasury and Finance

[T]here are also the problems which arise when considering access pricing for wastewater infrastructure, that rely on appropriate wastewater charging structures.

The recommended access price for the wastewater infrastructure of Sydney Water was determined by the Australian Competition and Consumer Commission (ACCC) to be a 'retail minus' approach. Such an approach is based on the basic principles of charging the access seeker the difference between the retail price of the services and the incumbent's avoidable costs.

Assuming therefore that any State based access regime is based on the New South Wales experience (as recommended by the ERA in its recent Final Report into Competition for the Water and Wastewater Services Sector), the continued use of valuation based charges for wastewater would heavily distort the access price payable to the incumbent and provide inefficient pricing signals to access seekers. (Department of Treasury and Finance submission, p7)

In terms of alternative approaches to property-based pricing, the Water Corporation favours a fixed charge for residential wastewater services.

Water Corporation

The standard alternative to valuation based charges for residential customers is a fixed service charge. Other approaches based on the quantity of discharges into the sewer also have merit, but are not currently available as there are difficulties associated in measuring

> the discharge. Additionally, there should be no incentive to avoid discharging domestic effluent to the sewer….(Water Corporation submission, p42)

Other submissions recommended charges based on estimated sewerage volumes, although the Department of Water acknowledged some difficulties with this approach:

> **Department of Water**
>
> The Department of Water would support examination of the feasibility and potential for efficiency offered by wastewater charges based on estimated volumes, including for residential customers. However, it acknowledges that several matters that could affect this proposal.
>
> - If the long run and short run marginal cost of augmenting wastewater service capacity is low, there may be minimal efficiency in a volumetric charge.
> - An estimated volumetric charge could overcharge some customers, for example those with a large proportion of external water use. However even if conservative assumptions were made about the proportion of water discharged to sewer or about the proportion of wastewater revenue that could be collected through volumetric charges, estimated volumetric charges may still be more efficient than a pure fixed charge.
> - Depending on the extent to which water and wastewater are complementary goods, volumetric wastewater prices could also affect efficient water consumption.
>
> (Department of Water submission, p5)
>
> **D. Wettenhall**
>
> Domestic sewerage would be approximately proportional to domestic water intake. Therefore, sewerage rate administration costs could be reduced if the charges were included as a part of the water supply charges. This would equitably reflect that water discharge is an integral part of the cost of water supply. (D. Wettenhall submission, p1-2)

The Water Corporation and the Department of Treasury and Finance acknowledged that there would be some transitional issues associated with a move away from GRV-based pricing:

> **Water Corporation**
>
> Any changes should be phased in so that the transition to an alternative tariff structure minimises the impact to these customers. (Water Corporation submission, p42)
>
> **Department of Treasury and Finance**
>
> However, the transitional problems with moving from value based charges with such inherent inefficiencies is acknowledged, when customers in high value properties (and therefore possibly higher incomes) would likely receive a decrease in price whereas those in lower value properties (and therefore possibly lower incomes) would likely receive an increase in price.
>
> Therefore, there is a need for the investigation of alternate and clearly separated and specifically targeted measures (for example a targeted rebate mechanism) to address the transitional problems as a means of enabling the removal of property value based wastewater charges. (Department of Treasury and Finance submission, p7)

The WA Council of Social Services (WACOSS) expressed concern regarding the general level of Water Corporation's wastewater bills, given that the Water Corporation's wastewater service operating costs are one of the lowest in the country:

WACOSS

WACOSS supports further investigation into [the Water Corporation's wastewater bills]. The Water Corporation has one of the lowest operating costs for wastewater services, yet they have the highest wastewater bills for a typical residential household. (WACOSS submission, p14)

4.4.3 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.[28] The Authority noted in 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:

  > The Government has previously rejected alternative charging options for wastewater charges on the basis that any proposed change could adversely impact lower socioeconomic customers. 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, 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.[29]

[28] 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 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.

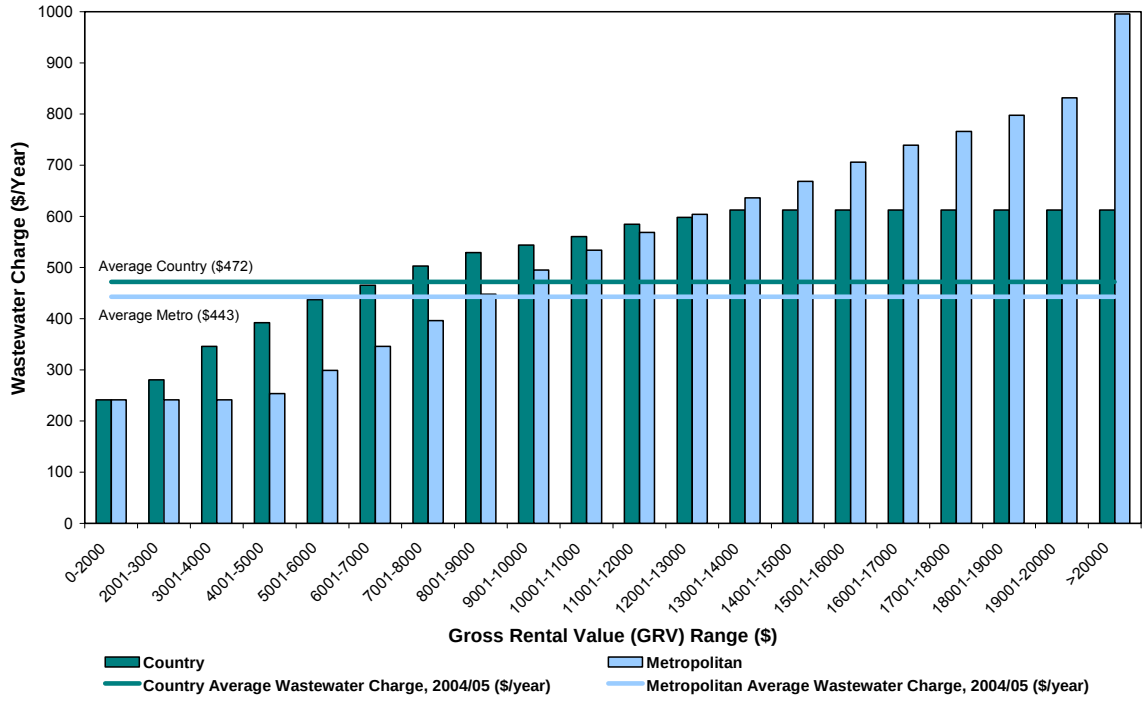
[29] However, the access seekers decision to enter the market would still be efficient as the retail price it pays would be recovered from its retail customers (less an amount to encourage switching); entry occurs only if savings in avoidable costs can be achieved.

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.

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 Water Corporation has proposed that the current wastewater pricing approach be replaced with a fixed charge:

> The standard alternative to valuation based charges for residential customers is a fixed service charge. Other approaches based on the quantity of discharges into the sewer also have merit, but are not currently available as there are difficulties associated in measuring

> the discharge. Additionally, there should be no incentive to avoid discharging domestic effluent to the sewer.
>
> There is a trade-off between cost reflective charges and a tariff structure that is simple to administer. The quality and quantity of the discharge, coupled with peak flow requirements and distance to the treatment plant are the main cost drivers that can vary between customers.
>
> Due to the difficulties associated with pursuing cost reflective prices and as there very little level-of-use decision to be made by residential customers when using the wastewater service, simplicity and customer acceptance should be of primary consideration to any charging alternative. While the Corporation supports a move away from valuation based charges, it is mindful of the adverse impact this may have on customers with low GRV properties. Any changes should be phased in so that the transition to an alternative tariff structure minimises the impact to these customers. (Water Corporation, p42-43)

A flat charge across all residential properties is likely to be more cost reflective than prices based on property values. There is no evidence to suggest that indoor water usage, which is the appropriate base for estimating wastewater discharge, differs significantly, on average, between households in properties of different value. However, a flat charge across all properties would not take account of differences in volumes of wastewater discharges between properties that may result from differences in the number, ages and lifestyles of occupants.

The Authority is of the view that the most cost reflective price structure for residential wastewater services would be to determine charges on the basis of estimated interior household water, based on a measurement of winter water usage. The correlation of winter water usage and wastewater discharge is likely to be particularly strong for the Perth metropolitan area (relative to other Australian cities) due to the predominance of winter rainfall. The use of winter water use as a proxy for wastewater discharge would, however, require that the Water Corporation align meter reading with the rainy season (which in Perth could cover the period from the beginning of May to the end of August. It is understood that the Water Corporation is considering increasing its billing frequency to quarterly, which would facilitate a move to wastewater charging on the basis of winter water usage. As long as meters were read twice within the rainy period, the resulting estimate of “winter” water usage would be reasonable.

The Water Corporation has advised that there would be other practical design considerations: the fact that the rainy season differs across the State would need to be taken into account; wherever the wastewater provider differs to the water provider, a system of information transfer would need to be developed; and adjustments may be required in towns requiring seasonal peak capacity to deal with tourism.

The actual structure of the resulting wastewater charge could have either one or two parts. A single charge that varies across households could be calculated by applying a “discharge factor” to the household’s winter water usage. For example, the wastewater charge could be 0.95 times the winter water usage (assuming that nearly all water going into a house is discharged down the sewer). This approach could be simplified by grouping households into, say, 10 bands of winter water usage with the same charge applying within each band. Alternatively, instead of a single charge, there could be a two-part tariff with an annual fixed charge that all households pay and a variable charge that varies across households.

The Authority’s preference at this stage is a single charge with, say, 10 bands of winter water usage with the same charge applying within each band. The Authority will be investigating design options for the final report.

Transitional Issues

There would be two transitional issues associated with moving from GRV-based wastewater pricing to winter water usage based wastewater pricing. The first is the practical one of designing the new charging arrangements and modifying the billing system. The second transitional issue relates to the financial impact on customers.

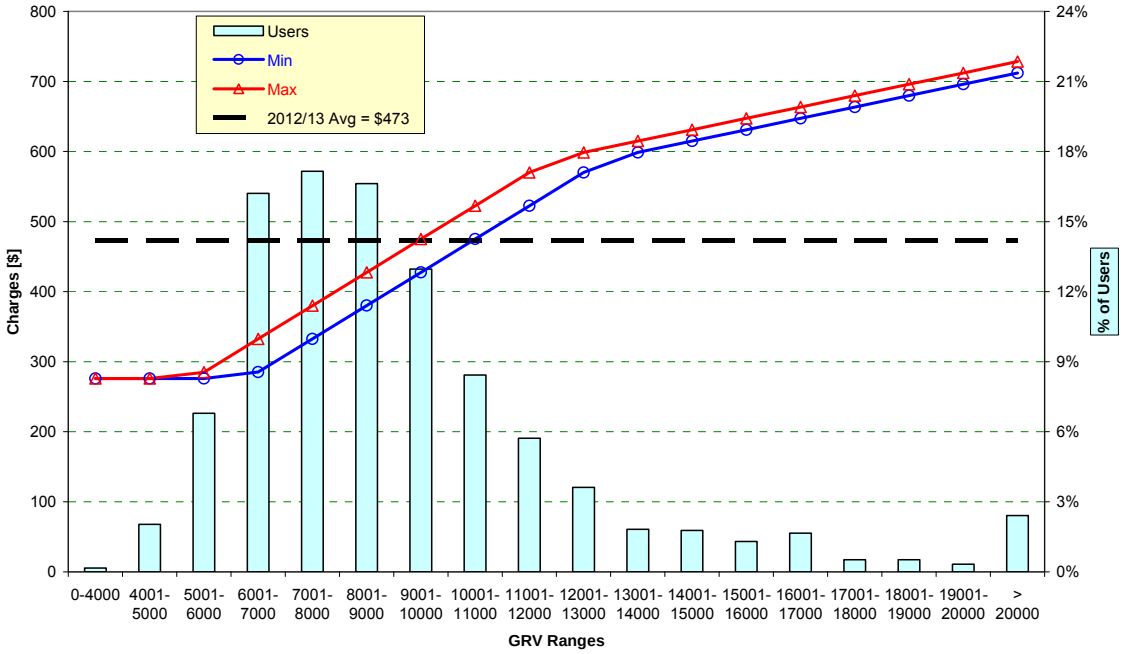
On the first issue, it is possible that a winter water usage based approach could not be implemented by 1 July 2010, which is the date from which the tariff recommendations from this inquiry, if adopted, would apply. It may therefore be appropriate to apply a flat charge for the first year of the three year pricing period or until such time as the new approach could be implemented.

On the second issue, 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).

For the purpose of illustration, the Authority has analysed the impacts if households in Perth were transitioned to a flat charge (which is likely to have similar implications to transitioning to a charge based on winter water usage).

Figure 4.2 illustrates the impacts on households in Perth of moving to a flat wastewater charge. The horizontal line shows that the flat charge would be $473 in 2012/13. The two inclining lines show the range of charges that currently apply within each band of GRV. For example, if a household has a GRV within the range $7,001 to $8,000 the current charge is between $332 and $380 per year. The columns in the figure show the percentage of households within that GRV band (e.g.17 per cent of households have a GRV between $7,001 and $8,000). Households with a GRV below approximately $10,000 would have an increase in their bills while those above this GRV would have a decrease in their bill.

Figure 4.2 Distribution of Perth Household Wastewater Charges (2008/09), Real Dollars of 2008



The Authority estimates that the conversion to a flat charge over the course of the regulatory period would result in:

- 9 per cent of households currently on or close to the minimum charge facing an increase in their annual bill of up to $179;
- 16 per cent of customers facing an increase in their annual bill of $146;
- 17 per cent of customers facing an increase in their annual bill of $99;
- 16 per cent of customers facing an increase in their annual bill of $51;
- the remaining 42 per cent of customers would face either a small increase or a reduction in their annual bills.

The annual impacts associated with the transition over the regulatory period would be approximately one third of the impacts shown above.

Conclusion

Overall, the Authority favours basing wastewater charges on estimated winter water usage as this would be the most cost reflective approach. However, it would require the Water Corporation to move to quarterly billing, which it is understood is currently being considered, and would require time to design and change billing systems, which means it may not be able to be implemented by 1 July 2010. Once designed, a transition period of at least three years is likely to be required 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

In the issues paper, the Authority asked for comments as to whether the current tariff structures for non-residential wastewater services are reflective of the costs of service. For example, is the number of sewerage fixtures the best basis for setting the service charge, rather than other measures, such as an estimate of water usage (potentially based on water meter size)?

A further matter to be considered is whether there is merit in calculating tariffs on a scheme-by-scheme basis rather than applying the Perth charges to the country. This issue is discussed in section 11.5.3.

4.5.2 Submissions

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:
>
> 5) The benefit of having a wastewater service available (fixed annual service charge);
> 6) The quantity discharged into the wastewater system (volumetric charge); and
> 7) 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, p43)

> **Department of Treasury and Finance**
>
> The number of fixtures is a reasonable proxy for determining service level demands from customers. Therefore, while adopting an alternative method is not opposed, a clear case would need to be made (including a cost benefit analysis) for the introduction of reforms to the structure of the charge given the very weak link between price and the demand for the service. (Department of Treasury and Finance submission, p8)

4.5.3 Assessment

As indicated in submissions, the number of fixtures is likely to provide a reasonable estimate of the costs of providing wastewater services to commercial customers. The Authority has not received any indication that an alternative measure (such as meter size) would provide a better basis for setting the wastewater service charge to commercial customers.

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. However, as will be discussed in section 11.5.3, the Authority considers that the charges should be calculated on a scheme-by-scheme basis rather than calculated only for Perth and then uniformly applied to all country towns.

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 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 Draft Recommendations

Draft Recommendations

10) 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).

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

12) 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 $73.17 per year.

    b) Non-residential drainage customers with land area from 1,000 square meters to 10,000 square meters be charged $365.85 per year.

    c) Non-residential drainage customers with land area above 10,000 square meters be charged $731.70 per year.

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

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

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 identify a reasonable case on

efficiency grounds for charging one resident more than another.[30] For example, everyone benefits at some time from draining recreational parks and roads, from preventing flooding, or from preventing 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.

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 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 could 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, 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 local authorities request this. 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.[31]

[30] 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.

[31] 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

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).

The current funding arrangements for the Water Corporation's drainage system is provided below:

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

In addition, local governments providing drainage services recover their costs from rates and specific drainage charges, which are not regulated.

The Water Corporation recovers its costs from metropolitan customers through drainage charges based on GRV (Gross Rental Value); see Appendix C and Appendix D for the current charges. Local councils recover their costs through council rates, or in some cases, specific drainage 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 headwork 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, and no more). Note that the water boards do not provide drainage services.

An issue is whether the tariff structure for drainage is appropriate or whether it should be changed from its current GRV basis to an alternative approach. For example, in NSW, Sydney Water and Hunter Water provide trunk drainage services, which are funded through a standard stormwater drainage charge. However, other States base their charges on local government rates. For example, in Queensland and South Australia, drainage services are provided by local government and funded through council rates, which are based on land values, and through developer charges. In Victoria, Melbourne Water is responsible for drainage infrastructure provision and planning, which is funded through a developer charge levied by Melbourne Water. Local councils maintain the infrastructure and recover their costs through rates.

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.

A further matter 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.

- In NSW, local councils have the option of levying a separate charge, in addition to their standard rates, to recover the costs of additional stormwater management

activities to meet obligations under the NSW Government's Urban Stormwater Program.

- In Melbourne, drainage developer charges have two components: (i) a drainage scheme charge, to recover the cost of drainage infrastructure; and (ii) a stormwater quality charge, to cover the cost of stormwater quality initiatives in each scheme. In developments that do not meet specified stormwater quality targets, a charge is applied to the mass of nitrogen discharged above a minimum standard.

The funding of drainage services in Western Australia is currently being reviewed by the Department of Water.[32] It is understood that this review will involve consideration of governance and institutional arrangements, the roles of service providers, service standards, the level of funding required, 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 Submissions

Water Corporation

Annual drainage charges are currently based on a property's GRV. As with residential wastewater charges, GRV based charges are administratively cumbersome and difficult to explain to customers who complain that they bear no relationship to the cost of providing the service. The Corporation would strongly support a change from valuation based charges, acknowledging, however, that departure from the current approach is likely to result in increased charges to low valued properties. This impact however, is only likely to affect commercial customers as most residential customers currently pay the fixed minimum charge of a (relatively) low $63 per year.

Additionally, as information on the land value of non-residential properties is only maintained for drainage charges, there would be cost efficiency gains to the Corporation in moving off GRV based charges. Similar efficiencies for residential customers would only be available if wastewater charges were also decoupled from property values.

…

Of the alternatives to drainage charges, the Corporation's preference is for a drainage charge based on a property's land area, extended across the entire metropolitan region. A three tapered structure (for example, less than or equal to 1,000m^2, between 1,000 m^2 and 10,000 m^2 and greater than 10,000 m^2) appears appropriate. (Water Corporation submission, p44-45)

The Corporation is compensated by the State Government via a Community Service Obligation payment for the cost of country drainage services. Any decision to reduce or remove the current subsidy is a decision for the Government. (Water Corporation submission, p46)

Department of Treasury and Finance

The current institutional structure of the drainage sector is considered to be more of a barrier to the efficient delivery of services than the current pricing regime. In any case, any property value based charging structure is opposed.

The current structure of the drainage sector in the Perth metropolitan area means that not all households receive a drainage service from the Water Corporation and therefore not all households pay a Water Corporation drainage charge. Households that are not drainage customers of the Water Corporation, are serviced by their respective local councils.

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

This arrangement gives rise to a number of cross-subsidies, which are most clearly articulated in the case of the riverside foreshore and other communal areas such as Kings Park. Both of these areas are drained by the Water Corporation and therefore funded by the Water Corporation's drainage customers but the entire community benefits from the drainage of those areas. Therefore, any reforms to drainage pricing, will only impact the Water Corporation's drainage customers and not those serviced by their local councils, despite both customer types receiving the same levels of service.

The yet to be finalised Department of Water review of drainage structures should be released before any reforms to pricing are contemplated. However, if that process is unable to deliver a result, then a fixed charge payable by all households is the preferred approach.

The link between levels of service demand and price are practically non-existent for drainage and therefore the most efficient and equitable pricing structure would be a flat charge, that recovers the cost of delivering the service equally from all those who benefit. (Department of Treasury and Finance submission, p9)

The cost recovery of drainage services from customers in country towns is strongly supported. How that should occur and whether there are any transitional considerations need to be cognisant of the following:

- the levels of service provided to country drainage customers and whether that level of service is different in the towns compared to the more regional country areas;
- the rationale for calculating a scheme by scheme method of cost recovery or whether, given the disparity between price and service level demand, a State-wide charge is more appropriate; and
- whether there is any scope to provide pricing or funding incentives to the service provider to seek and enhance drainage quality outcomes.

Further consideration of these matters by the ERA is encouraged and the DTF looks forward to reviewing any subsequent options for introducing drainage charges to customers in country towns. (Department of Treasury and Finance submission, p9)

Department of Water

The Department of Water would be interested in receiving the Economic Regulation Authority's perspective on the advantages of alternative charging methods. For example, charges based on property size may correlate well with an "impactor pays" approach of assigning costs, especially for commercial properties that can vary substantially in size. However it may also add administrative complexity. (Department of Water submission, p5-6)

The Department of Water is investigating the feasibility of modifying existing drainage funding arrangements. However no specific proposal for reform has been agreed and the Water Corporation's existing responsibilities for drainage could be expected continue for at least some time. (Department of Water submission, p5)

5.6 Assessment

The Authority has considered the following issues:

- The types of benefits from drainage.
- The allocation of costs to public beneficiaries.
- The allocation of costs to developers.
- The allocation of costs to customers in the Water Corporation's main drainage area in Perth.

- The allocation of costs between residential and non-residential customers within the main drainage area.
- The impacts on customers of alternative charging methods.
- The allocation of costs to country customers.

Each issue is discussed in turn below.

5.6.1 Benefits of Drainage

Drainage systems provide benefits, ranging from:

- public benefits such as reduced flood damage to public facilities, increased possibilities for recreation opportunities, reduced incidence of waterborne disease resulting from flooding by contaminated water, improved water quality and improved aesthetic environment; to
- private benefits such as reduced flood damage to private facilities, land value enhancement, and increased value of properties.

Often the benefits arising from the drainage systems will be valued by individual customers as well as the wider population (such as reduced flood damage). For the purpose of this report, benefits that have public and private benefit characteristics are referred to as mixed benefits.

5.6.2 Allocation of Costs to Public Beneficiaries

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 and 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.

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 could 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.

Water Corporation has indicated that it has considered adding approximately $40 million per year (in real dollar values of 2008) to its capital expenditure programme from 2012/13 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.[33]

In conclusion, 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 considered further at the next regulatory review, particularly if the Water Corporation proposes to incur capital expenditure on improving drainage quality.

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

5.6.3 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 incidence effects of these benefits mainly stay with customers in the newly developed areas.

The current up-front headwork charges account for 40 per cent of the average value per lot of existing urban drainage infrastructure. Possible options for setting developer charges are to charge:

(i) 100 per cent of the average historical cost of providing drainage infrastructure;

(ii) the average cost per lot developed in a period of, say, 10 years; and

(iii) an estimate of future capital expenditure required for new development areas.

The current standard headwork charge is $440 per residential development lot. When 10 years is considered, the average cost per lot is $660. The charge would be $1,150 when 100 per cent of the long term average costs of existing assets are included.

The Authority considers that continuing to charge $440 would under-recover revenue from developers and would result in higher annual charges for customers within the main drainage area. However, charging the average historical cost may result in over-charging given the recent experience over the past 10 years, which indicates lower expenditure possibly as a result of economies of scale. The Authority therefore proposes that developers be charged the average cost per lot developed for the last ten years.

5.6.4 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. It is therefore unclear what purpose is served by using 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 case 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.

The Water Corporation has proposed using land area as the method for charging non-residential customers and a flat charge for residential customers. The Corporation proposed three tiers of land area (or footprint) be considered: (i) less than 1,000 square meters; (ii) from 1,000 to 10,000 square meters; and (iii) greater than 10,000 square meters.

The Authority considers that the Water Corporation's proposal has merit. In designing the charges for each tier, the Authority has considered two options.

- Option A has been designed so that the medium charge is 5 times the low charge and the high charge is 10 times the low charge.
- Option B has been designed so that the medium charge is 10 times the low charge and the high charge is 20 times the low charge.

The resulting drainage charges under Option A and Option B are shown in Table 5.1. For example, under Option A shown in Table 5.1, the annual charges, which would commence in 2009/10 and be maintained in real terms, would range from $75.64 for residential and low-footprint non-residential customers, to $378.10 for medium-footprint non-residential customers, to $756.39 for large footprint non-residential customers.

Table 5.1 Alternative Area Based Drainage Charges (Real Dollars of June 2008)

	Option A ($ per year)	Option B ($ per year)
Low (All residential plus non-residential less than 1,000 sqm)	73.17	59.09
Medium (non-residential between 1,000 and 10,000 sqm)	365.85	590.94
High (non-residential above 10,000 sqm)	731.70	1,181.88

The Authority has considered each option with reference to the financial impacts on customers, which is discussed in the next section.

5.6.5 Impacts on Customers of Alternative Charging Methods

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 Option A, all of Water Corporation's residential drainage customers would pay a drainage charge of $73.17. The majority of Water Corporation residential customers would face an increase in their bills of approximately $7.5 per year. The remaining Water Corporation customers with relatively high GRV properties would generally receive a reduction in their drainage bills.
- Under Option B, all of Water Corporation's residential drainage customers would pay a drainage charge of $59.1. There would not be any significant impact on the majority of the Water Corporation's residential customers.

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 $1,222 per year or less.
- Low GRV/high land area customers, such as nurseries and market gardens would see their drainage charges being increased to either $731.7 per year or $1181.88 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.

On balance, the Authority prefers Option A because it results in a relatively small increase in payments by households while minimising the payment increases to low GRV/high land area non-residential customers. There may be an argument by market gardeners and other low GRV/high land area customers without significant drainage requirements that the applicable charge is too high. Some flexibility in charging may be required to provide for high land area customers who do not have a significant drainage requirement to make a case for not being charged at the high drainage rate.

5.6.6 Allocation of Costs to Country Customers

The Water Corporation has provided the following advice to the Authority on the operation of its country drainage services:[34]

> The Water Corporation operates and maintains a rural drainage service to six country drainage districts proclaimed under the *Land Drainage Act 1925*. The Mundijong, Waroona, Harvey, Roelands, Busselton and Albany Drainage Districts are located in coastal areas of the south west of Western Australia. Although serving some small rural townships, the rural drainage service was originally provided to allow agricultural development in the declared areas. While the primary function of an urban drainage system is to protect land from flooding, the operating licence level of service for rural drainage allows the capacity of the rural system to be designed to allow flooding of agricultural land for up to three days.
>
> The current demand for development of residential and special rural lots has resulted in issues for the planning and management of the rural drainage service. Major issues include the limited capacity of the downstream rural drainage system, development within flood plains and the resolution of ownership of the urbanised drainage infrastructure.

The Authority will be considering the allocation of drainage costs in country areas in the next stage of the inquiry.

[34] Email from Water Corporation to the Authority, 12 March 2009.

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 Draft Recommendation

Draft Recommendations

15) Where practical, charges for minor tariffs associated with water, wastewater and drainage services should reflect the efficient costs of service. The Authority will examine the cost reflectivity of the Water Corporation's minor tariffs for its final report.

16) Subsidies to public and charitable institutions for water and wastewater services be either paid for by a CSO 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.

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

18) 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.

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

20) 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 it should be funded by a CSO.

Other variations to standard charges exist for practical reasons. In these cases, the administrative costs involved in improving cost reflectivity would be too high, so there is no recommendation to change these prices.

In some cases, non-standard tariffs reflect the different costs involved in delivering particular services. Again, there is no recommendation to change the pricing for these categories, apart from ensuring that charges reflect as closely as possible the costs of service.

6.4 Background

The Water Corporation has a range of tariffs and charges which vary from the standard charges in their category. The reasons for these non-standard charges are various, and often mixed, including adjustments to reflect specific costs of service, equity and political considerations, and 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

Variations from standard charges that are aimed at reflecting the costs of particular services include the following:

- a lower fixed charge for the non-potable water supply to the Brighton Estate;
- fully commercial water usage charges for metropolitan portable standpipes, at the highest non-residential unit price. Standpipes are used mainly for dust suppression during construction works;
- charges for discharging industrial waste to the Water Corporation's sewers, which vary by the type and load of contaminant;
- charges for particular services associated with industrial waste, such as issuing permits, meter reading, inspections, production evaluation, sampling, and the management of fasts, oils and grease;
- discounts for early payment of accounts, and additional charges and higher interest rates for overdue payments.

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 not at this stage examined whether the particular charges accurately reflect costs, but will investigate the costs of service and pricing of these services in preparing its final report. However, in the case of portable standpipes, as these are metered, they could therefore be charged according to the tiered pricing structure for non-residential water usage, rather than set at the highest non-residential price.

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 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, cemeteries.

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

There is no efficiency basis for these charges, and if such services are to be subsidised, it would be more transparent for this to be carried out 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 draft 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 $17 million per year.

There is a particularly significant impact on non-residential metropolitan wastewater customers from making this change, because the cross-subsidy is estimated at $10.9 million per year for wastewater customers receiving the discount. If the current situation were to continue, average non-residential metropolitan wastewater charges would reduce from $996 per year in 2008/09 to $936 per year in 2012/13. With the unwinding of the cross-subsidy, average non-residential metropolitan wastewater charges reduce to $762 per year in 2012/13 (in real dollar values of 2008).

The cross-subsidy to metropolitan water customers is $4.3 million and to country wastewater customers is $2.2 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.[35] 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 water and wastewater charging approach for the community residential properties.

[35] 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 Pricing

Water usage charges for farmland (both metropolitan and non-metropolitan), local government standpipes and stock watering are discounted, at a fixed price of $1.083 per kL. This price was put in place largely for equity reasons. The price is the same for each of the services as the services are the same (e.g. water for metropolitan farms or standpipes are drawn from the same system as for non-metropolitan farms). However, the price is not cost-reflective, and in the case of water drawn from the Goldfields and Agricultural System, is below the opportunity cost of the water on that system.

It would be better for water usage charges for farmland, local standpipes and stock watering to be set on a cost-reflective basis. However, water usage in these cases would be both for residential purposes, as well as commercial. Prices could be set in a way similar to those for caravan parks or mixed commercial/residential properties, with a quota for essential residential use set at a low price, with non-residential pricing above this amount.

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 in a number of ways:

- 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 accepted, it would be appropriate to charge 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 of obtaining GRVs for storage units and parking bays, and their lower contribution towards drainage costs, compared with standard residential units.

Mixed Commercial/Residential Properties

Some properties 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 cost reflectivity of this price could be improved by making it consistent with the non-residential consumption usage charges for each 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. It is appropriate for vacant land to be charged less than non-residential charges, since vacant land has no fixtures, and services are available but are not used. However, the GRV-based charge is an anachronism, as non-residential charges are now based on fixtures and volume, and 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: DRAFT 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 Draft Recommendation

Draft Recommendations

21) 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).

22) The Water Corporation, Aqwest and Busselton Water 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.

23) For the length of the three-year regulatory period, the Water Corporation, Aqwest and Busselton Water should not be compensated whenever actual demand varies from forecast demand. Instead, the service providers should bear this demand risk.

24) Any significant capital expenditure proposal that exceeds a certain threshold amount be subject to a capital expenditure efficiency test, conducted by the Authority under its inquiry function (submissions are invited on the appropriate level of the threshold).

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 as a real annuity spread over the life of the Water Corporation's capital expenditure).

28) Cash contributions from developers be calculated consistent with the recommendations of the Inquiry into Developer Contributions to the Water Corporation (e.g. by excluding any contributions to source expenditure).

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

7.3 Reasons

The Authority's draft recommendations in this section would have the consequence of treating Water Corporation, Aqwest and Busselton Water in a manner similar to the way other regulated entities are treated. The purpose of economic regulation is to attempt 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, they have to demonstrate that their capital expenditure has been efficiently incurred before they can recover the cost from customers, they face the risk associated with planning for uncertain demand, and inflationary adjustments to tariffs are made on the basis of movements in the eight-city Consumer Price Index. In addition, other regulated entities generally are required to review their service standards at the same time as they have their tariffs reviewed because of the need to demonstrate that customers are willing to pay for any change in service standards.

This section also considers a number of technical issues, such as the treatment of developer contributions and the calculation of CSOs, that each 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 way tariffs are calculated. In future, the Authority recommends that CSOs be set for the three year regulatory period and be calculated using the same cost model as is used to calculate tariffs

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[36] *multiplied by* 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.

[36] The calculation of the rate of return in discussed in Appendix F.

These tariffs are updated through annual reviews that take into account updated forecasts of demand and efficient costs.

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 up to generate the revenue requirement. Similarly, if costs turn out to be higher than expected, tariffs will also be adjusted up 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.

7.5 Submissions

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, p3)

7.6 Assessment

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. Three significant 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 has considered the following issues that influence the determination of revenue requirements for each service provider:

- treatment of inflation;
- treatment of developer contributions; and
- calculation of developer revenue.

A further issue of relevance currently only to the Water Corporation is the calculation of CSO payments.

Each of these issues will be considered in turn.

7.6.1 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 ultimately benefit consumers.

The way in which the current approach provides incentives for the Water Corporation, Aqwest and Busselton Water to achieve cost savings is to set required revenues on the basis of efficient capital and operating expenditures.

The current approach differs from that adopted in 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 often 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 created as the business is able to keep any savings below the forecast level of costs for a specified period of time. However, customers also benefit from the cost savings, as prices are reduced after that period down to the efficient cost levels. 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. This means that the regulated business will earn more in years when sales are high. There is 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.

Submissions

The Water Corporation recommended that the option of a three-year fixed real price path be considered.

> The Corporation would like to consider the option of fixing a real price path for three years. Obviously, such a decision is for the Government to make as it would need to commit to a pricing decision for a number of years.
>
> However, the Corporation would like the ERA to consider the merits of such an approach and include the mechanics of how the arrangement might work. A three year fixed price path would need to ensure that the price impact of any difference between forecast and actual expenditure during the three year period is subsequently adjusted for, provided the expenditure is demonstrated as being efficient.
>
> (Water Corporation submission, p54)

Assessment

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.

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 and would also reduce the regulatory costs associated with the current annual updates.

The Authority also considers that if service providers are able to exceed the target level of efficiency savings then they should be able to retain this saving 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.

At present, the Water Corporation bears no risk if actual demand varies from forecast demand, as revenues are adjusted for any forecasting errors. The reason for the current approach was 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. However, as water restrictions have been made permanent, this source of demand risk has been removed.

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. It is a risk that the Authority considers should be applied to the Water Corporation, Aqwest and Busselton Water. The Authority acknowledges that it will require greater scrutiny of demand forecasts (as service providers would have an incentive to under-forecast demand) but considers that the potential benefits to customers outweigh this concern.

A further consideration is 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 particular performance targets are not met. 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. However, a level of compensation is incorporated into current arrangements: for example, Water Corporation provides customers who experience three separate confirmed interruptions to their potable water supply of more than one hour with a 100 kL allowance against their annual consumption. The Authority invites submissions

on whether a stricter compensation regime should be implemented, such as through Guaranteed Service Levels.

Overall, the Authority considers that 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). For the length of the three-year regulatory period, the Water Corporation, Aqwest and Busselton Water should not be compensated whenever actual demand varies from forecast demand. Instead, the service providers should bear this demand risk. In addition, where operating expenditure efficiency targets are applied and the service provider achieves a higher level of efficiency savings, then the service provider should be able to retain the additional savings for the length of the regulatory period.

7.6.2 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.[37] 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).[38]

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.[39]

- 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.

[37] See Chapter 9 of the *Electricity Networks Access Code 2004*.

[38] 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.

[39] 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.*

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.[40] However, there is no independent regulatory oversight of capital expenditure during a regulatory period. Nevertheless, significant capital expenditure proposals are subject to sign-off by the Government's Cabinet Expenditure Review Committee.

Submissions

No submissions were received on this issue.

Assessment

The Authority considers that it would be appropriate to apply a capital expenditure efficiency test to the Water Corporation, which would be conducted by the Authority. Such a test could be conducted under the Authority's inquiry function. The aims of the test would be to establish that any proposed major capital investment:

- maximises 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
- is 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 Authority does not consider that a full NFIT is necessary in this case (i.e. involving an assessment of whether the incremental revenue associated with an investment can recover its costs). The NFIT works best in circumstances where efficient investment decisions can largely be negotiated between the infrastructure owner and the user on an "incremental user pays incremental cost" basis. Under these conditions, the benefits of investments are clearly associated with particular users, and these private benefits can be reflected in the prices for the services.

However, investments in water and wastewater infrastructure generally provide benefits that are dispersed widely amongst users of the infrastructure, both in space and in time. Also, investments may be undertaken for reasons of benefits that do not accrue to the user of the infrastructure service, such as health, environmental and town-planning benefits. For example, new developments have reticulated water supplies and reticulated sewerage for health, environmental and aesthetic reasons as well as for commercial reasons.

Submissions are sought 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.

[40] 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.

7.6.3 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 process of licence approval or monitoring. 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.[41] Any revisions of service standards as part of the license approvals process tend to occur in response to problems 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.[42] 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 establish as part of their licence conditions. Customer Service 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

[41] *Water Services Licensing Act 1995*, sections 36(1)(c) and 37(1).

[42] Water Corporation's Water Services Operating Licence, Schedule 4, available on the Authority's web site.

Service Charters developed by the Authority.[43] 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 (or alternative period as approved by the Authority). 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 by the ESC, 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 its service standards, or improve performance, or to raise service standards. These costs are then reviewed by the ESC in the price review. 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 to what standards;
  - consumer expectations about levels of service; 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 service levels to provide to customers, and how these service levels relate to forecast costs. In addition, water agencies need to report their performance against output measures set by IPART, and recommend appropriate output measures for the next regulatory period.

The Authority is of the view that there would be advantages to aligning the reviews of service standards for the Water Corporation, Aqwest and Busselton Water to coincide with the three-yearly price reviews.

[43] In August 2006, the Authority published the *Customer Service Charter Guidelines* 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.

7.6.4 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)

Assessment

The general approach applied by regulators to annual tariff escalation is to use the most recent annual increase in the eight city average CPI.[44] 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 a utility earning revenue that exceeds its costs for a period of time (although it would be expected that over time the two inflation measures would converge).

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

[44] 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.

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 draft recommendation is that annual tariff escalation be based on the most recent annual increase in the eight city average CPI.

7.6.5 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's case for change is as follows:

> 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 the following 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 asset value more closely aligns 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 and that their 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 what happens when 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;
- 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.

It can be seen that 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.[45]

[45] 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 issue of whether the existing approach leads to intergenerational inequity is unclear. 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.

The other equity consideration that is relevant is that the existing approach lowers the fixed charge for new customers by more which helps to reduce 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 concern that the Water Corporation has with the current approach is that it 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 and therefore volatility can not be avoided. However, the alternative approach does result in less volatility than the existing approach. 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 Water Corporation identifies particular problems in small country schemes where developments occur infrequently. Under the existing approach some schemes may have negative 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.[46] The Water Corporation's alternative approach would reduce the need for such adjustments (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. However, customers would not pay any tariffs under the existing system 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's concern is 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.

[46] 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.

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 revenue that has been quarantined is used only for development-related projects. Otherwise there is a risk that developers 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 entirely. 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).

It is the case that 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. One issue is the tariff implications of 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. As discussed in section 9.5, 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 would have been lower if the alternative treatment of developer contributions had been assumed. Instead of $10,988 million, the asset value

would have been $9,231 billion. This lower asset value is the one that 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, in section 9.5, 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. The Authority therefore does not consider there to be case 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 tariffs have 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 later.

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 payments 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 increase to such an extent that future dividend payments and taxes are impacted. To prevent such financial implications under the alternative approach, the owner would need to reduce its dividends.

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 pros and cons of changing the treatment of developer contributions. The pros include the reduction in tariff volatility, particularly for small schemes. The cons 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.

Overall, the Authority has produced its draft 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). However, the Authority would like the Water Corporation to consider the financial implications of its proposal before making a final decision on this matter.

Given the significant impact that the change in treatment would have on tariffs, the Authority considers that if the Water Corporation continues to support the change, then there should not be any price shock to customers. Instead, Water Corporation should be provided the additional revenue over time (the additional revenue amounts to $1,128 million in present value terms).[47] The revenue adjustment could commence following the next regulatory review and the additional revenue could be recovered as a real annuity spread over the 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.

7.6.6 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 the level of developer revenue that they each were receiving. In addition, the Authority's analysis as part of the Inquiry into Developer Contributions to the Corporation identified a set of principles for setting developer charges.

In the final report of the Inquiry into Developer Contributions to the Water Corporation, the Authority recommended that the current system of uniform charges across the State be replaced by a new system which varied the Corporation's developer charges in different towns, depending on development costs. In particular, the charges should only be based on the costs of expanding the distribution network and not include the costs of expanding transmission or source infrastructure. The Authority also concluded that there should be no caps to charges, as this would distort decisions about where developments are located, and is unlikely to achieve specific social objectives of Government.

To date there has been no government decision on this matter.

Submissions

No submissions were received on this issue.

Assessment

For the purpose of this draft report, the Authority has assumed that the recommendations of the Inquiry into Developer Contributions to the Water Corporation have been endorsed. The Authority has also applied its recommended main developer charges principle (that developer charges only relate to the costs of expanding the distribution network) to the Water Boards.

[47] 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.

The Authority has received projected developer revenue data from the Water Corporation. Table 7.1 shows the difference between the existing developer contribution projection and the new developer contribution projection for the metropolitan area and for each class of country towns.

Table 7.1 Variation in the Water Corporation's Developer Revenue Between Current Approach and Recommended New Approach (Real Dollars of June 2008)

	Present value of developer contribution revenue for the period 2009/10 to 2012/13	
	Current approach to setting developer revenue	Recommended new approach to setting developer revenue
Metropolitan		
Water	144.3	102.8
Wastewater	80.6	52.6
Drainage	10.8	10.8
Country		
Water	149.6	192.6
Wastewater	43.3	51.1
Total	**428.7**	**409.9**

The Water Boards have two main categories of developer contributions: mains sub-divisions and headworks. The Authority's recommended level of developer contributions only includes mains subdivisions. Table 7.2 shows the difference between the existing developer contribution projection and the new developer contribution projection for the Water Boards.

Table 7.2 Variation in the Water Boards' Developer Revenue Between Current Approach and Recommended New Approach (Real Dollars of June 2008)

	Average annual developer contribution revenue for the period 2010/11 to 2012/13	
	Old approach to setting developer revenue	Recommended new approach to setting developer revenue
Aqwest	$552,000	$69,000
Busselton Water	$643,000	$0

7.6.7 Calculation of Community Service Obligations Payments

Background

The issue of the calculation of CSOs is only a matter for 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 results. 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 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.

Submissions

As the Authority did not raise this as an issue in the Issues Paper no submissions were subsequently received.

Assessment

There are two issues with the way CSOs are currently calculated. The first issue is that CSOs are calculated using financial models that differ to the one used to calculate tariffs. There would not seem to be any reason to maintain more than one financial model which each have 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. In addition, the calculation of tariffs would no longer need to account for any over or under-recovery of CSO revenue resulting from inconsistencies between the 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 CSOs for 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.

Setting CSOs for a three year period would be consistent with the draft recommendation of not compensating the Water Corporation whenever actual demand varies from forecast demand. If tariffs are not to be adjusted for unexpected demand, it would be inappropriate to adjust CSOs for unexpected demand.

Overall, the Authority's draft recommendation is that CSOs should be calculated using the same financial model as is used to calculate tariffs and that CSOs should be set for a three year period.

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 Draft Recommendations

Draft Recommendations

30) 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.

31) Aqwest's and Busselton Water's revenue requirements be set on the basis of their operating and 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.

8.3 Reasons

The Authority considers that Water Corporation should be set the same target level of operating expenditure efficiency gains that currently applies. Aqwest and Busselton Water's operations are too small to apply an explicit efficiency target. However, the consultant's advice was that the level of efficiency gain being targeted by the Water Boards is appropriate.

The consultant's assessment of the Water Corporation's operating and capital expenditure has indicated that its planning and prioritisation processes provide confidence that it has appropriate processes in place to guide expenditure decisions. However, the Authority is intending to investigate further the Water Corporation's historical and proposed operating expenditure on level of service improvements. At this stage, the Authority has not been able to conclude that customers should pay for all of the expenditure that has either been spent or is planned.

The capital expenditure program will also be considered further once the Water Corporation advises the Authority of the program that is consistent with the borrowing limits set by the Government.

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 that results from this procurement approach.

The consultant 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 each of the following issues in turn:

- 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 cause the water utilities to incur certain costs that in some cases may not necessarily be incurred in the absence of the specific licence requirements. These are costs legitimately incurred in achieving the required levels of service and prices should be set at a level sufficient to ensure that these costs are recovered.

The Terms of Reference for the current inquiry require the Authority to consider whether the utilities have sufficient resources to meet the levels of service that are currently required.

8.5.2 Submissions

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.

Aqwest

Aqwest complies with the service requirements detailed in its Operating Licence. Aqwest aspires to the highest level of customer service. Overall customer satisfaction in 2008 was the highest this century. (Aqwest submission, p6)

To a large extent, the Corporation's service standards are dictated by the terms of its operating licence.

Water Corporation

The Corporation has a proven track record of meeting the operating licence requirements. While it currently has the resources to do this, trends of ever increasing regulatory obligations places continuing pressures on the Corporation's future resource requirements.

With the growth of recycling schemes and potential for use inside the home of non-potable water, services levels for non-potable water should be considered as part of the future direction for service standards.

(Water Corporation submission, p37)

WACOSS expressed concern over some existing service standards, and recommended improved service standards in a number of areas, such as debt management practices, and service provision to remote communities:

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.

Suggestions for improvement which are relevant to the development of further Service Standards include:

- Abolition of the use of supply restrictions as a debt management tool, as it can have serious and negative health and social impacts on consumers. This will be discussed in more detail later in this submission.
- Increased awareness of the social impact of debt management practices in particular supply restrictions. This can be achieved through attendance to appropriate training by staff around social issues and the impact of supply restrictions and disconnections on consumers.
- Immediate cessation of practice whereby concession eligibility is cancelled for the year where the customer has been unable to pay the full rebated amount in full within that year.
- 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.

(WACOSS submission, p5)

[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, p6)

The application of interest on debt by water utilities is unacceptable. Most major water utilities in Western Australia charge very high rates of interest on overdue debt. The interest is applied as a nominal penalty for non-payment of charges. This penalty occurs in addition to effective disconnection of supply and possible legal action. The application of high rates of interest on outstanding debt places additional financial burden on those who may already be experiencing difficulty in paying the overdue amount as a result of financial and other types of hardship.

While energy providers are able to charge interest on debt, they do not do so. The policy of the application of interest on overdue debt by water providers is unacceptable and should be discontinued in the interest of fairness and equity.

(WACOSS submission, p9)

WACOSS recommended the introduction in legislation of a customer services code, along with a code of conduct, enforceable by a Water Services Ombudsman.

> [T]here is a great need for water services to have effective hardship policies to ensure that these individuals and families are not disadvantaged.
>
> WACOSS provides strong support for the implementation of an enforceable code of conduct, as currently exists for the energy sector. In particular there is a need for a legislative customer services code with a strong focus on issues of consumer protection, including the interests of those consumers not currently considered customers such as tenants....
>
> 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 firmly recommends that such a scheme be conducted independently of the Department of Water, to ensure the impartiality and independence of the Ombudsman.
>
> (WACOSS submission, p9)

8.5.3 Assessment

The submissions to the inquiry highlight several issues regarding service standards:

- performance by the service providers in meeting existing service standards;
- concerns regarding current practices; and
- the absence of a Code of Conduct and a Water Industry Ombudsman.

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 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 have indicated a requirement for additional expenditure to improve on existing service standards on the basis of customer demands.

Concerns About Existing Practices

WACOSS has raised concerns about current practices by the water businesses and has recommended changes in some areas. Several of these 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 area of concern to WACOSS is the levels of service in remote communities. These matters are not reviewed in operational audits as there are not currently any service standards relating to these matters in operating licences.

Further information on the issues raised by WACOSS is provided below.

- **Supply restrictions.** The Water Corporation, Aqwest and Busselton Water currently restrict water flow rates (to a level of flow sufficient for health and hygiene purposes) in response to unpaid accounts. The conditions under which the Water Corporation will restrict or restore water supply are set out in its Customer Charter. The rights of the Corporation to restrict the supply of water are conferred by the *Metropolitan Water, Sewerage and Drainage Act 1909* (section 41).[48] However, the Water Corporation has had a moratorium in place on water supply restrictions since September 2008.[49]

  The *Water Boards Act 1904* (section 60) allows for the water boards to cut off 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-payment of accounts in 2007-08 at 1,405 for the Water Corporation, 23 for Aqwest and 67 for Busselton Water.

- **Concession eligibility.** 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. 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).

- **Interest rates on debt**. The interest rates to be 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.[50] The Water Corporation publishes a Debt Recovery Code of Practice, which sets out the Corporation's billing practices and debt recovery process.[51] The higher interest rates on outstanding accounts may be waived in some circumstances (e.g. if customers negotiate alternative payment arrangements with the Corporation, or if they are experiencing financial hardship, or if they are pensioners).[52]

- **Level of service in remote communities.** 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

[48] 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."

[49] The Water Corporation will become a participant in the Hardship Utilities Grants Scheme (HUGS) from 13 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.

[50] *Water Agencies (Charges) By-laws 1987*, Schedule 7(5) – Interest on overdue amounts (by-law 9).

[51] 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).

[52] 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.

government rather than the Authority. However, the Water Corporation's licence, which is regulated by the Authority, covers a number of remote communities.[53]

The Authority intends to investigate the cost reflectivity of the higher interest rate charges in preparing its final report for this inquiry. It should be noted that electricity retailers may also charge higher interest rates on outstanding accounts, in accordance with electricity retail by-laws.[54] Synergy charges customers with outstanding accounts above $1,000 interest of 12.75 per cent per annum.

On the issues of restricting water supply and restricting eligibility to concessions, the Authority notes that the water businesses have the powers under legislation to use these methods (i.e. they are not currently covered by licence conditions or the Customer Service Charters).

Code of Conduct and Water Industry Ombudsman

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 contracts, under the *Electricity Industry Act 2004*.[55] Similarly, in the gas sector, the Gas Customer Code 2008, to be set as a licence condition in all gas trading and distribution licences to protect small use gas consumers, will take effect from 1 July 2009.

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 Background

As discussed in section 7.6.1, the Authority considers that in future service providers should not be compensated or rewarded for a variation in revenue or operating costs associated with fluctuations in demand that it did not anticipate at the time of a regulatory review. Under this new arrangement, demand projections take on a greater role and a greater level of scrutiny is required. The Authority has not at this stage conducted a thorough assessment of the assumptions underlying the demand projections but will make this a significant part of the final report. The assumptions underlying the demand projections are provided in the section below.

[53] 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.

[54] *Energy Operators (Electricity Retailers Corporation) (Charges) 2006) by-laws*

[55] *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*

8.6.2 Demand Projections by Service Providers

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 applies different growth assumptions).

Table 8.1 Growth in Number of 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	2.0	2.0	2.0	2.0
Busselton Water				
Water	4.0	3.9	3.7	3.6

Source: Water Corporation, Aqwest and Busselton Water

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 programme 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%.[56]

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.

Table 8.2 Usage per Customer, as Assumed by Water Corporation, Aqwest and Busselton Water

	Residential	Non-residential
Water Corporation - Metro		
Water	259 kL/user	774 kL/user
Wastewater	Not applicable (there is no usage charge)	246 kL/user
Water Corporation – Country (weighted average)		
Water	313 kL/user	1,199 kL/user
Wastewater	Not applicable (there is no usage charge)	222 kL/user
Aqwest		
Water	268 kL/user	857 kL/user
Busselton Water		
Water	282 – 285 kL/user	845 - 849 kL/user

Source: Water Corporation, Aqwest and Busselton Water

The Water Corporation has advised that when forecasting volumes using usage per customer, the following specific adjustments are made:

- 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.[57]

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 (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 low compared to other utilities. Figure 8.1 shows that Water Corporation's Perth operations

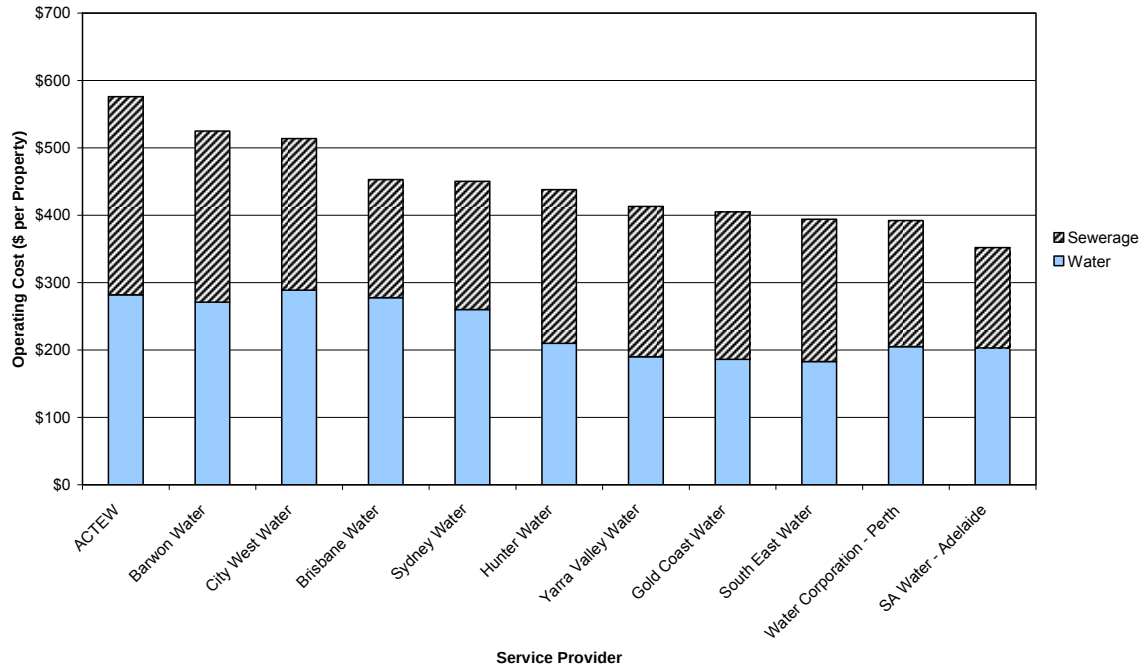
[56] Email from Water Corporation, 9 March 2009.

[57] Email from Water Corporation, 9 March 2009.

have a total operating cost per property that is lower than the costs of the other large water utilities except for SA Water. Figure 8.2 shows that AQWEST and Busselton Water have total operating costs per property that are in the bottom third when compared to water utilities of a similar size.

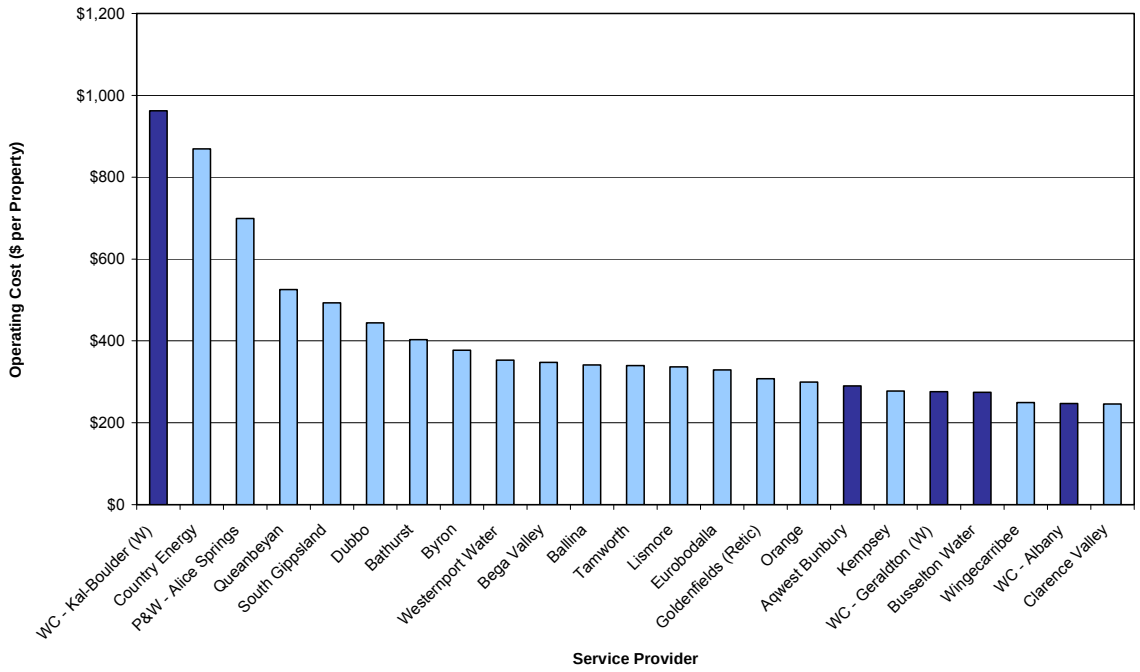
In presenting these figures, the Authority recognises that the use of benchmarking can be problematic: the number of suitable comparator businesses in Australia is small, and difficulties arise in determining whether differences in operating cost performance between businesses are due to different efficiencies, 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 2006-07 – Service Providers with 100,000 Customers or More



Source: Water Services Association of Australia Ltd, National Water Commission and NWI Parties (2008), National Performance Report 2006-2007: Urban Water Utilities.

Figure 8.2 Operating Costs for Water and Sewerage Services ($ per Property) in 2006-07 – Service Providers with 10,000 to 20,000 Customers



Source: Water Services Association of Australia Ltd, National Water Commission and NWI Parties (2008), National Performance Report 2006-2007: Urban Water Utilities.

8.7.2 Submissions of a General Nature

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 over the period since the 2005 pricing inquiry to the projected operating expenditure for that period, 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 operating expenditure that was incurred in the past (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.

However, 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). This approach does, however, provide for a review of historical operating expenditure.

Halcrow Pacific was asked to focus their analysis on the appropriateness of operating expenditure that was claimed to provide level of service improvements. In comparison to base operating expenditure, which was $462 million in 2007/08, expenditure to provide level of service improvements is relatively small. 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. Table 8.3 classifies the Water Corporation's claims for operating expenditure adjustments into the following categories:

- 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 infill sewerage program which is fully funded by a CSO;
- Government program without associated CSO revenue – e.g. using renewable sources to power the desalination plants; and
- 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
Perth Seawater Desalination Plant	-	1,900	22,623
Level of service operating costs associated with new capital expenditure	-	472	6,040
Compliance with regulatory standards that existed in 2004/05 – foreseen expenditure	855	8,439	2,960
Compliance with regulatory standards that existed in 2004/05 – unforeseen expenditure	-	2,461	3,562
Non-regulated activities (with associated revenue)	-	1,690	- 1,091
Government program (with associated CSO revenue)	-	178	462
Government program (without associated CSO revenue)	-	-	-
Water Corporation Initiatives	2,383	3,311	8,968
Total	**3,238**	**18,451**	**43,525**

Source: Water Corporation

It can be seen from Table 8.3 that of the $67 million in level of service related operating expenditure incurred in total over the three years, approximately $12 million 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 $25 million was spent on source development in addition to that expected in 2004/05). $6 million was spent unexpectedly in complying with the standards that existed in 2004/05. Almost $15 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.

Halcrow Pacific had insufficient information to come to a conclusion on the appropriateness of this expenditure on level of service improvements. The Authority will be undertaking further analysis of this expenditure before providing its final report to the Government in June.

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 future level of service increases.

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 very close to that agreed to be government following the 2005 inquiry (the variance was less than one per cent). This achievement was 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 (which the Authority is continuing to investigate). This indicates that the Water Corporation was able to meet its efficiency target in the recent past.

On the issue of the Water Corporation's processes for prioritising operating expenditure, Halcrow Pacific concluded:

> We are satisfied that the Corporation has developed a series of robust and rigorous operational planning and delivery processes that align appropriately with the Corporation's Risk Framework and its overall corporate and strategic objectives. (p 80)

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 noted:

- 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).

The proposed efficiency target is in line with the target applying to water businesses in New South Wales and higher than the target applying in Victoria.

On the issue of whether Water Corporation can continue to achieve the proposed target, Halcrow Pacific investigated Water Corporation's concern that its expenditure on discretionary initiatives would need to be reduced. Examples of discretionary initiatives include asset inspections, improvement of asset management systems, IT support and training programs. Actual expenditure on discretionary initiatives ranged between $7.5 million and $18.3 million over the period 2005/06 to 2007/08. The Water Corporation's proposed expenditure on discretionary initiatives decreases from $8.0 million in 2008/09 to $0.8 million in 2012/13. However, as there is significant overlap

between this expenditure and items of expenditure included in the level of service expenditure, it would be appropriate to investigate this matter further as part of the additional work identified above.

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 2008/09 to 2012/13 ($,000, Nominal, Year Ending 30 June)

Type of operating cost	2008/09	2009/10	2010/11	2011/12	2012/13
Perth Seawater Desalination Plant	25,286	26,581	29,616	31,141	31,920
Southern Seawater Desalination Plant (SSDP)	-	-	-	35,200	31,373
SSDP – Renewable Energy Premium	-	-	-	11,000	11,352
Level of service operating costs associated with new capital expenditure	12,181	18,506	19,023	21,279	21,762
Compliance with regulatory standards that existed in 2004/05 – foreseen expenditure	3,437	3,278	3,530	3,547	3,662
Compliance with regulatory standards that existed in 2004/05 – unforeseen expenditure	13,598	7,882	8,186	8,611	8,762
Non-regulated activities (with associated revenue)	316	1,112	1,783	2,448	3,448
Government program (with associated CSO revenue)	10,858	5,995	1,087	1,182	1,204
Government program (without associated CSO revenue)	1,879	3,212	4,009	4,009	4,044
Water Corporation Initiatives	22,864	32,788	36,842	36,969	37,404
Total	**90,420**	**99,354**	**104,076**	**155,387**	**154,931**

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 is 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 is relative large and includes a range of projects, the most significant of which are:

- Asset Condition Assessment Gap Treatment Management Program, which seeks to improve asset management to reduce levels of asset failures and disruptions to customers ($50 million over the period 2008/09 to 2012/13);

- Water mains cleaning, to clean built-up sediments and biofilm, to potentially reduce the need to flush-out the reticulation system and to reduce the levels of customer complaints for odour and taste ($26 million over the period 2008/09 to 2012/13);
- 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 ($26 million over the period 2008/09 to 2012/13);
- Sustainability Strategy, to embed sustainability principles into the Water Corporation's decision making ($13 million over the period 2008/09 to 2012/13); and
- Water Cycle Strategy, which is intended to increase the management and planning of the Water Corporation's non-drinking water service ($11 million over the period 2008/09 to 2012/13).

In general, Halcrow Pacific advised that it did not have sufficient information to reach a conclusion on the Water Corporation's operating expenditure on level of service increases. It is also not clear to what extent the expenditure on Water Corporation initiatives includes expenditure that should be accounted for as part of base operating expenditure. The Authority is intending to investigate this matter in more detail for the final report.

Halcrow Pacific identified a specific issue in relation to 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 do so.

Conclusion

The Authority has accepted Halcrow Pacific's advice 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. Further investigation of the Water Corporation's operating expenditure associated with improving levels of service will be undertaken for the final

report. However, 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 for unaccounted for water, energy consumption, off peak power usage, operating cost per property and operating cost per ML, and reports on these 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, in particular, to minimise energy costs. In addition, a project to reduce unaccounted fro 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 $329 in 2004/05 to $353 in 2007/08. In comparison, Busselton Water's operating cost per connection has decreased from $299 to $266 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. The Authority is intending to examine the cause for the differences in operating expenditure between the two service providers in more detail for the final report.

Projected operating expenditure

Aqwest did not comment in their submission on the level or appropriateness of any future operating expenditure efficiency target.

Aqwest's real operating cost per connection is projected to decrease from $353 in 2007/08 to $243 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 seek out and 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 draft report, 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 $299 to $266 between 2004/05 and 2007/08. In reviewing Busselton Water's historical operating expenditure, Halcrow Pacific did not identify any expenditure that was inappropriate.

Projected operating expenditure

Busselton Water's real operating cost per connection is projected to increase from $266 in 2007/08 to $313 in 2012/13. The increased operating expenditure is associated with water production and administration costs. The Authority is intending to investigate the cause of the increase in more detail for the final report.

As with their advice in relation to 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 draft report, 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.

In assessing the processes for project delivery for each of the water businesses, the Authority has engaged Halcrow Pacific to undertake the analysis. The consultant's reports are available on the Authority web site and the Authority welcomes comments on any matters raised in those reports.

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 engaged 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 programme that was 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".

Issues raised by Halcrow Pacific include:

- 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 not be kept secret from 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 test whether they are still adequate to deliver the increased capital works programme that is expected from 2012/13.

Planned expenditure

The Water Corporation's currently approved capital expenditure program (i.e. the program approved by government in 2007/08) for the period 2008/09 to 2012/13 amounts to $4,027 million (in nominal dollars). Projected capital expenditure is expected to average $805 million per year, compared to $670 million per year over the period 2005/06 to 2007/08.

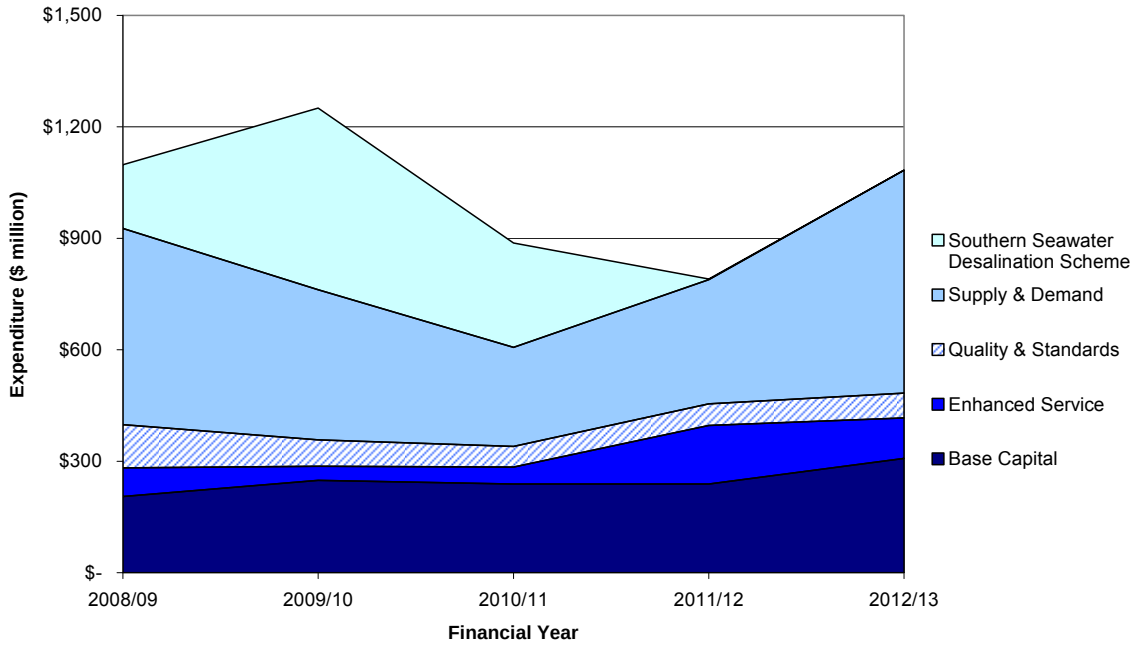
The Water Corporation allocates its capital expenditure on the basis of:

- 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 2008/09 to 2012/13.

Figure 8.3 Water Corporation Capital Expenditure Forecast by Expenditure Driver ($Million, 2008/09 - 2012/13)



Source: Water Corporation

Major projects include:

- $935 million on the Southern Seawater Desalination Plant;
- $2,674 million on regional projects in Western Australia;
- $230 million on Alkimos WWTP;
- $205 million on Mundaring Water Treatment Plant.
- $145 million on Beenyup WWTP; and
- $37 million on Woodman Point odour control.

The Authority is aware that a revised capital expenditure program is currently before the Government for funding approval. The Authority has therefore limited its analysis of proposed expenditure at this stage to reviewing the Water Corporation's capital processes (which, as was discussed above, provide confidence that capital projects are selected and prioritised appropriately). Once the Authority is advised of the funded capital expenditure program, it will consider in more detail the appropriateness of the capital expenditure on the most significant projects.

Conclusion

For the purposes of this Draft Report, the Authority has incorporated into the draft tariff projections the Water Corporation's capital expenditure program that was endorsed by the Government in 2007/08. The draft tariff recommendations presented in this report will need to be revised on the basis of the Government's capital expenditure funding decision as part of the State Budget. The Authority will then investigate in more detail the efficiency of the capital expenditure program.

On a specific matter, submissions are sought on the issue of whether the Water Corporation's Strategic Development Plan, or a similar document providing the 5-year direction but without commercially sensitive information, should become a public document.

Aqwest

Historical expenditure

Aqwest's capital expenditure programme that was 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) with the purpose of reducing 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 programme for the period 2008/09 to 2012/13 amounts to $34.4 million (in nominal dollars). Projected capital expenditure is expected to average $3.7 million per year, compared to $6.5 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

The Authority has accepted Aqwest's proposed capital expenditure.

Busselton Water

Historical expenditure

Busselton Water's capital expenditure programme that was 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 did not find that any of the historical expenditure was inappropriate.

Capital processes

Halcrow Pacific advised that they were satisfied with Busselton Water's strategic planning processes and risk management approaches. Issues raised 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 programme for the period 2008/09 to 2012/13 amounts to $19.5 million (in nominal dollars). Projected capital expenditure is expected to average $3.9 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

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 Draft Recommendations

Draft Recommendation

33) For Water Corporation, the rate of return (pre-tax real) be set at 5.41 per cent.

34) For Aqwest and Busselton Water, the rate of return (pre-tax real) be set at 5.72 per cent.

35) 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.

36) The initial asset values used for the purpose of determining tariffs be set at $11.3 million for Aqwest and $9.0 million for Busselton Water (as at 30 June 2005, in real dollar values of 2005).

37) The initial regulatory asset value for Water Corporation was set in 2005 and 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 a lower rate of return to the Water Corporation, Aqwest and Busselton Water. While there has been upward pressure on the debt margin due to the changes in global financial markets, the nominal risk free rate is lower than it was in 2005. In addition, 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 (the equity beta has been revised down). Further, the Authority considers that, for the purpose of calculating the rate of return, a credit rating of A- should be applied rather than the BBB+ as previously recommended.

The higher rate of return for the Water Boards reflects their lower debt/equity ratio and lower equity beta.

The parameters in the WACC formula have been updated as of 30 January 2009 and will be further updated before the final report. The parameters will need to be updated once again in 2010 prior to the tariffs being set for the regulatory period.

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.

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 (and a lower associated equity beta value).[58]

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.

[58] The assumed level of financial gearing of the businesses affects the appropriate assumption as to the equity beta. For a given asset beta (i.e. the level of exposure of the entire business to systematic risk, rather than just the returns to equity), the equity beta will vary in proportion to the level of financial gearing. That is, a lower level of financial gearing will correspond to a lower equity beta. For AQWEST and Busselton Water, an equity beta value of 0.60 at 40 per cent gearing is equivalent to an equity beta of 0.80 for the Water Corporation at 60 per cent gearing.

Since the WACC was originally set in 2005, there have been a number of parameter changes to the calculation inputs, largely driven by changes in global financial markets with increased margins for those wishing to secure debt.

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:

> The Corporation notes that, given 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 presented Table 9.1 in their submission, showing 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 will be calculated using the market data prevailing at the time that the Authority provides its final advice in June 2009. For this draft decision, the Authority has adopted a 20 trading days average for 10 years Commonwealth bond, which is consistent with the approach used in previous decisions.

At this stage, a nominal risk free rate of **4.08 per cent** has been used, based on the estimate for the 20 trading days to 30 January 2009.

Australian market risk premium

In accordance with recent decisions from the Authority and other regulators around Australia, the Authority proposes to adopt a market risk premium of **6.00 per cent**.

Equity beta

The Authority proposes to adopt an equity beta of **0.65** for Water Corporation, and **0.62** for Aqwest and Busselton Water.[59] 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 Water Corporation, Aqwest and Busselton Water would be consistent with a decision by the ESC in June 2008 on Victorian non-metropolitan water prices.

The Cost of Debt

The Authority proposes a cost of debt of **3.075 per cent** for the Water Corporation, Aqwest and Busselton Water, which includes a debt margin of 295 basis points and debt issuing cost of 12.5 basis points for the Water Corporation.

These costs would need be updated when the Authority makes its final recommendation in June 2009.

The Benchmark Financing Structure: Debt versus Equity

The Authority proposes to adopt 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. These however are commonly assumed gearing levels for businesses in the water industry.

Inflation rate

Given the current circumstance of the financial markets, together with recent evidence from other regulators across Australia, the Authority proposes to adopt the inflation rate of **2.5 per cent** (the midpoint of the Reserve Bank's inflation target).

[59] For AQWEST and Busselton Water, an equity beta value of 0.54 at 40 per cent gearing is equivalent to an equity beta of 0.65 for the Water Corporation at 60 per cent gearing.

Corporate tax rate

The Authority proposes to adopt the statutory rate of corporate income tax of **30 per cent**.

Value of imputation credits

In accordance with recent decisions, the Authority proposes to adopt the value of imputation credit of **0.5**.

Conclusion

In conclusion, with all proposed parameters, the real pre-tax WACC (Officer formula) is proposed at **5.41 per cent** for Water Corporation and **5.72 per cent** for Bunbury and Busselton Water Boards. These figures are both lower for Water Corporation and the water boards, from 5.63 per cent and 5.87 percent respectively, in comparison with the Authority's decision in November 2005.

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 Draft 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%	**4.08%**	**4.08%**
Real Risk Free Rate	2.42%	2.42%	3.49%	3.49%	3.49%	**1.54%**	**1.54%**
Inflation Rate	2.74%	2.74%	2.75%	2.75%	2.75%	**2.50%**	**2.50%**
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%	**2.95%**	**2.95%**
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%	**3.075%**	**3.075%**
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**	**0.62**
Corporate Tax Rate	30%	30%	30%	30%	30%	**30%**	**30%**
Franking Credit	50%	50%	50%	50%	50%	**50%**	**50%**
Nominal Pre Tax WACC	8.53%	8.77%	9.80%	10.59%	11.02%	**8.05%**	**8.37%**
Real Pre Tax WACC	**5.63%**	**5.87%**	**6.87%**	**7.63%**	**8.05%**	**5.41%**	**5.72%**

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.[60] 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.

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

While the Water Corporation accepted the valuation, 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[61]).

> 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)

9.5.3 Assessment

The concerns that the Authority has in accepting the book value as the initial regulatory asset value include:

- For each of the three service providers it would result in tariff revenue that varied from that provided to the Authority at the time of the deprival value calculation.
- The book value includes assets that were contributed by developers and for which the service providers are not entitled to profit from.

The Authority has reconsidered the calculation of the initial asset values given the concern that has been raised by Aqwest. The Authority has undertaken two exercises. The first exercise checks to what extent the book value includes assets that were contributed by

[60] 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.

[61] Aqwest 2006 Annual Report.

developers. The second exercise checks to what extent the revenue projections that were used as part of the deprival value approach are cost reflective.

The exercise that checks to what extent the book value includes assets that were contributed by developers was undertaken as follows. Ideally, this exercise would take the book value at the point in time when the water service provider began receiving developer contributions and to roll it forward by adding capital expenditure and subtracting depreciation, while taking care not to add to the asset base any assets that were funded by developer contributions. However, data limitations constrained the exercise to the period from 1996. Using this approach, the initial asset values determined for each service provider as at 30 June 2005 (in dollar values of 2005) were:

- $10,812 million for the Water Corporation (compared to a book value of $9,922 million);
- $19.4 million for Aqwest (compared to a book value of $44.5 million); and
- $9.7 million for Busselton Water (compared to a book value of $13.7 million).

It can be seen that the initial asset value for the Water Corporation calculated using this method is higher than the book value, whereas for the Water Boards the initial asset values are lower. Generally, it would be expected that the derived values would be lower than the book values because of the presence of developer contributions. However, in the case of the Water Corporation the impact of developer contributions appears to be more than offset by the impact of accelerated depreciation on the book value.

The second exercise checked to what extent the revenue projections that were used as part of the deprival value approach are cost reflective. This exercise involved calculating the asset values that would have resulted in 2005 if any under- or over-recovery of revenue over the period from 1996 to 2005 was capitalised into the asset base (it also takes care not to include in the asset base any assets that were funded by developer contributions). This exercise has been undertaken in the past for the purpose of setting the initial asset value for the Goldfields Gas Pipeline. The resulting asset values can be compared to the asset values calculated using the deprival value method to see whether the revenue projections underlying the deprival value method were too high or too low.

Using this approach, the initial asset values calculated for each service provider as at 30 June 2005 (in dollar values of 2005) were:

- $12,922 million for the Water Corporation (compared to a deprival value of $10,599 million);
- $3.2 million for Aqwest (compared to a deprival value of $25.1 million); and
- $8.4 million for Busselton Water (compared to a deprival value of $14.7 million).

The difference between these values and the values calculated using the first exercise are entirely due to tariff revenue being either too high or too low (rather than due to developer contributions).

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.

For Aqwest, the calculated asset value is significantly lower than the deprival value, which indicates that the revenue projections used to calculate the deprival value were too high. It

shows that revenue over the past ten years has been significantly higher than necessary to cover expenditure.

For Busselton Water, the calculated asset value is somewhat lower than the deprival value, which indicates that the revenue projections used to calculate a deprival value were too high.

In conclusion, the Authority considers that the asset values for the Water Boards calculated by the Authority in 2005 using the deprival method are likely to have been too high. Those asset values would provide for a continuation of tariff revenue that is higher than necessary to cover costs, and in the case of Aqwest, significantly so.

The higher revenue may be partly attributable to the Water Boards' decisions to finance capital expenditure from retained earnings, which requires higher tariffs from existing customers until such time as reserves are established at a level that is sufficient to fund lumpy capital expenditure.

While the Authority acknowledges the Water Boards' rights to determine their own financing arrangements, the Authority is concerned that continuing to apply tariffs that generate revenue that exceeds efficiently incurred costs would not be appropriate. The Authority considers that the Water Boards should be treated on the same basis as other regulated water service providers of a similar size, that is by assuming a representative gearing. In the 2005 inquiry, the Authority considered that the Water Boards should have a rate of return calculated on the basis of a 40 per cent gearing (which is less than the 60 per cent that is applied to the Water Corporation). Setting tariffs on the basis of this gearing assumption will eventually result in the Water Boards taking on debt.

Overall, for the Water Boards' initial asset values, the Authority considers that the deprival value method should not be applied because it makes use of a revenue projection that is too high. An alternative approach is to set the initial asset value at the value that is obtained by adjusting the book value for any assets funded by developer contributions. However, this value would leave Aqwest with reserves that will never be needed to fund future capital expenditure because the Authority's standard approach ensures that capital expenditure will be covered by future tariffs.

For the purpose of this draft report, the Authority has applied an initial asset value of $11.3 million for Aqwest and $9.0 million for Busselton Water (in real dollar values of 2005). These values are mid-way between the values calculated using the two methods referred to above.

The Authority has investigated the financial impacts on Aqwest and Busselton Water from setting the initial asset value as proposed. Modelling of the financial accounts for the next 10 years indicates that Aqwest and Busselton Water remain in healthy financial positions, as is illustrated below (all values are in real dollars of 2008).

- Aqwest's net asset position increases from $85 million to $102 million over the next 10 years and at no time does it need to take on debt (interest bearing assets are worth $10 million at 2017/18). Aqwest's net profit ranges from $1.4 million to $2.4 million.
- Busselton Water's net asset position increases from $60 million to $69 million over the next 10 years. Debt funding is required from 2017 (the gearing level in 2017/18 is 4 per cent and interest bearing assets are reduced to zero). Busselton Water's net profit ranges from $1.3 million to $0.8 million.

In the case of Water Corporation, there is a case for increasing the regulatory asset value on the grounds that the revenue projection underlying the deprival value approach may have been too low (given the probable under-recovery of revenue in previous years). However, given the Water Corporation's low actual gearing (less than 20 per cent), and their previous acceptance of the deprival value, it is unlikely that continuing to apply the deprival value will cause any financial problems for the Water Corporation.

For the purpose of this draft report, the Authority has not revised the initial asset value calculated for the Water Corporation at the time of the 2005 inquiry.

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 Draft Recommendations

Draft Recommendation

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

39) Rebates for water efficient products (other than rain sensors, garden assessments and flow regulators) be discontinued, as the water savings achieved are more costly to society than the alternative of producing more potable water.

10.3 Reasons

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 (more costly than 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).

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. Sprinkler restrictions have been discussed earlier in section 2.6.2.

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

Another key approach to demand management is the Waterwise rebates program, which is funded by government and provides customer rebates for a range of water-efficient products. Rebates currently available include:

- Greywater reuse systems – this rebate provides up to $500 or 50 per cent of the purchase/installation cost (which ever is the lesser amount) for an approved system
- Domestic rainwater tanks – tanks with a capacity greater than 600 litres that are not plumbed-in are eligible for a rebate of $50. Tanks with a capacity greater than 2,000 litres are eligible for a rebate of up to $600 or 50 per cent of the purchase and plumbing in cost (whichever is the lesser amount), if they are plumbed-in by a licensed plumber for use in a toilet and/or washing machine when installed.
- Garden bores – for sites that are eligible, a rebate of $300, or 50 per cent of the installation cost for a new bore (whichever is the lesser amount), is available per residential property.
- Waterwise garden irrigation systems – a rebate of $300, or 50 per cent of the installation cost (whichever is the lesser amount) is available.
- Washing machines – washing machines rated 4.5 stars or above qualify for a $150 rebate.
- Sub-surface irrigation systems – a rebate of $10 is available for each 30 metre roll of sub-surface irrigation pipe (up to 10 rolls per household).
- Rain sensors – a rebate of $20 is available per rain sensor (one per household).
- Swimming pool covers – swimming pool covers that meet Waterwise standards qualify for a $200 rebate, or 50 per cent of the cost, whichever is the lesser.

- Flow regulators – a rebate of $2 is available for flow regulators rated 3 stars or above (up to $20 per household).
- Waterwise garden assessments – a rebate of $30 per household is available for garden assessments to advise on waterwise gardens.

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.

10.5 Assessment

The role of sprinkler restrictions in balancing water supply and demand has been considered earlier (see section 2.6.2), with the Authority recommending that sprinkler restrictions be reconsidered once the Southern Seawater Desalination Plant is operational.

The Authority has considered the appropriateness of rebates as an instrument to encourage the cost effective adoption of recycling and other sources. The effectiveness of rebates depends on the cost per kL of the resource cost of the water source (inclusive of the rebate) in comparison to the resource cost of scheme water.

The Authority has also considered the cost effectiveness of mandatory standards, as imposed through the 5-Star Plus building codes for new houses.

10.5.1 Submissions

The Water Corporation submitted that its demand management programs 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)

Aqwest also submitted that its water efficiency measures 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)

10.5.2 Rebates

Any examination of the cost-effectiveness of rebates should take 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.

It should also be recognised that not all rebate products purchased will be bought because of the rebates. The number of purchases that can be attributed to the presence of a rebate will depend on how sensitive customers are to the price of the product (with and without the rebate).[62] It is important, therefore, in assessing the rebate policy, that the water savings achieved by the rebate program only be attributed to those purchases that are specifically due to the rebates.

Analysis provided to the Authority by the Department of Treasury and Finance indicates that there are very few rebate products that are cost effective when compared with the cost of securing new potable water supplies. The Department's analysis has been reviewed by the Authority and its consultants, Economic Research Associates, and some of the assumptions amended to reflect recent findings on water efficiency savings. The assumptions and results of the analysis are presented in Appendix G.

A key assumption is the estimated water savings for each product, which are highly dependent on how the products are used. Maximum savings would be achieved if a product is used in accordance with the manufacturer's guidelines and garden watering guidelines. However, user behaviour will have a considerable impact on the water savings actually achieved, so that the cost effectiveness of rebate products will vary between users. For example, rain sensors can be ineffective in reducing potable water demand if they are not coupled with effective sprinkler control systems.

[62] The sensitivity to price is known as the demand elasticity (i.e. the percentage change in the demand for a product given the percentage change in price).

For most products, therefore, average water savings will be lower than manufacturers' estimates, and for some products, average water consumption may even increase. For example, the Authority's consultants indicate that the Water Corporation has conducted a recent study of actual water use by households in Perth, which suggests that:

- sub-surface irrigation increases water use on average, as users tend to run their systems more frequently and for longer periods than above-ground watering systems;
- upgrading existing swimming pool covers (from ones not eligible for rebates to ones that are) increases water consumption on average, as pool temperatures are raised and pools are used more often;
- greywater re-use systems appear to increase water consumption. The reasons for this are unclear, but may be due to a reduced incentive to achieve in-house water savings.[63]

For products such as these, where the behavioural response may result in increased water use, offering rebates could actually be counter-productive in terms of the objective of saving water.

The analysis finds that for stand-alone water saving products, only rain sensors, garden assessments and flow regulators involved costs per unit of water saved that were less than the benefits as measured by the opportunity value of producing potable water.

The analysis indicates that domestic garden bores, rainwater tanks and new swimming pool covers cost between $3 per kL and $6 per kL of water saved, compared with the cost of the most expensive source of potable water (desalination) of approximately $2 per kL. However, a recent National Water Commission (NWC) study on rainwater tanks suggests that the water savings for large tanks could be less than half of the savings assumed in this analysis.[64] If the NWC estimates are used, the costs for large rainwater tanks would be over $8 per kL of water saved.

Other products involve embedded water-saving technology (e.g. water efficient washing machines).

- In the past, when many washing machines were not very water efficient, the use of rebates to encourage customers to switch to washing machines that were much more water-efficient would have produced substantial water savings. However, as the water efficiency of washing machines in the market (and households) in general improves, the additional water savings – from customers switching from a water efficient machine to an even more water efficient machine – become smaller.
- The analysis assumes that rebates encourage customers to switch from a 4-star rated washing machine to a 4.5-star rated washing machine, and finds this to be an expensive way to achieve water savings (an estimated cost per kL of water saved of around $128 per kL). The value of the rebate is also further diminished if the water saving technology does not add to the cost of manufacture, or if customers would choose the water efficient machines anyway.

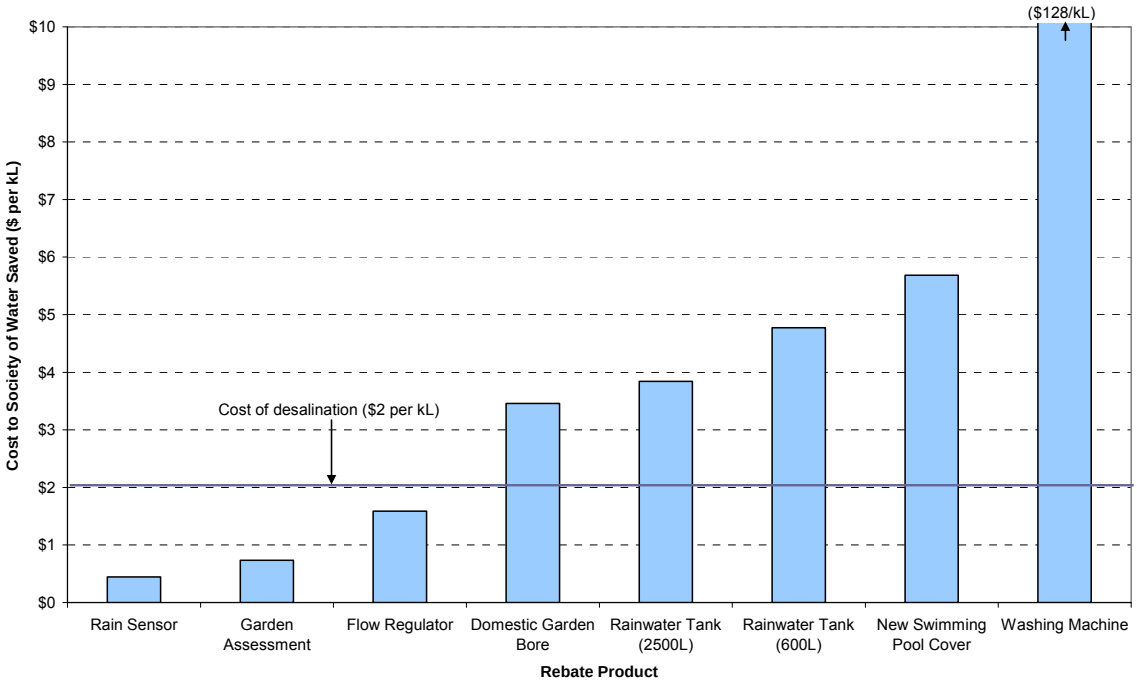
[63] These water use estimates are based on the small number greywater re-use systems installed in Perth, so may not be statistically significant.

[64] Marsden Jacob Associates (March 2007), *The Cost-Effectiveness of Rainwater Tanks in Urban Australia*, a study carried out for the National Water Commission. This study estimated the water savings for a 2,500 litre tank at 28 litres per year, compared with 61 litres assumed in the analysis in this inquiry.

The analysis is based on some simplifying assumptions.[65] However, further refinement of the assumptions would be unlikely to alter the broad conclusions of the analysis.

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.

10.5.3 Mandatory Standards

The cost effectiveness of mandatory standards will depend on the cost per kilolitre of water saved.

Mandatory standards are likely to be more cost effective for new houses, where implementation costs can be minimised in the design process of new homes and developments, than for retrofitting of existing properties. However, the 5 Star Plus program only applies to new homes and is not mandatory for existing homes.

[65] The elasticity of demand is assumed constant and the same for all products, as there is little information on the sales of the products before and after the rebates. See Appendix G for a full description of assumptions.

The current standards relate to tap fittings (other than bath outlets and gardening taps), showerheads, and sanitary flushing systems. These standards complement the current rebate system. In many cases (e.g. shower heads, taps or toilets) there would be little or no incremental cost to the consumer between buying a water efficient technology as opposed to a high water use technology. This is particularly the case once new mandatory standards have been incorporated into the general design and technology of new homes. In this case, mandatory standards may impose minimal additional costs on consumers, while producing savings in potable water.

The Authority's finding is 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. However, in line with the findings on rebate products, mandatory swimming pool covers appear to be an expensive way to achieve water savings (i.e. more costly than producing more potable water).

11 Cost Allocation

11.1 Terms of Reference

This section does not addresses 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 the appropriate tariff levels for each of the service providers.

11.2 Draft Recommendations

Draft Recommendations

40) The annual fixed charge be set at the same level for all small-use water customers (those using a 20mm meter), whether they are residential or small business customers.

41) The uniform approach to charging metropolitan and country commercial wastewater customers be removed.

42) The costs of providing wastewater services within a scheme be allocated between residential and commercial customers in a way that is reflective of relative estimated discharge into the sewer.

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 small use water customers (residential and small businesses) it is inappropriate to continue to have large differences in fixed charges (residential customers currently pay $180.50 while small businesses pay $500.30). These charges should be brought into alignment over time. 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. 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.

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 water customers is maintained at its 2004/05 level.

- The sharing of costs between commercial and residential metropolitan wastewater customers is maintained at its 2004/05 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 Water Customers

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 in some way to achieve a more cost reflective allocation of costs.

Submissions

> 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 modeling 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)

Assessment

The Water Corporation does not consider there should be any change to the method used to allocate costs between residential and non-residential customers. That is, the allocation of costs that was implicit in the 2005 tariffs should continue. The Water Corporation justifies its view on the basis that because the fixed charge does not influence water usage decisions it 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 non-residential customers being set on a consistent basis, fixed charges differ substantially. The residential annual fixed charge is currently $180.50 while small businesses currently pay $500.30.

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. This can be achieved 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 on which the differences in fixed charges are currently calculated).

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). It could be considered fair because there is a clear rationale for differences in payments between different types of customers.

Relative to the current approach, this change would not result in a significant change in the fixed tariff for residential customers (the fixed charge is higher by $5 under the change).

The Authority's draft recommendation is that the method of cost allocation be changed to align the residential and small business fixed charges.

11.5.2 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 76 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 $19 higher than under the current approach, while commercial metropolitan wastewater charges would be $91 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

Metropolitan Wastewater Customers	Average Annual Payment		Change in Average Annual Payment Between 2008/09 and 2012/13	
	2008/09	2012/13	$	%
Option 1 – Costs Allocated on Basis of Current Tariff Structure				
Residential	530	454	-76	-14%
Non-Residential	996	853	-143	-14%
Option 2 – Revenue Shares in 2012/13 Reflect Proportion of Discharge				
Residential	530	473	-56	-11%
Non-Residential	996	762	-234	-23%

The Authority's preferred approach is Option 2, which would align costs more closely with discharge volumes than the current approach. The impacts of applying Option 1 instead of Option 2 are presented in Appendix J.

11.5.3 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 primary 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 non-residential wastewater pricing. The consequence of applying uniform prices to country non-residential wastewater customers, but scheme-based costs to country residential wastewater customers, is that residential customers in some schemes may pay more than their fair share of the wastewater costs. However, it is acknowledged that a cost-based approach will be more administratively burdensome because commercial wastewater tariffs would be required for each town.

Overall, the Authority considers that country non-residential wastewater customers should have their charges set to reflect a fair allocation of the wastewater costs in a scheme. The relative discharges by residential and non-residential customers will vary from scheme to scheme. However, the Authority's preferred approach is to allocate country wastewater costs between residential and commercial customers in a way that is reflective of relative estimated discharge.

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 2008) – Water Corporation

Asset Account	2010	2011	2012	2013
Opening Asset Value	13,566.209	14,227.528	14,542.408	14,714.563
Capital Expenditure	1,016.861	695.054	568.242	762.357
Depreciation	-355.541	-380.175	-396.086	-405.918
Closing Asset Value	**14,227.528**	**14,542.408**	**14,714.563**	**15,071.002**
Cost of Service	**2010**	**2011**	**2012**	**2013**
Operating Expenditure	564.116	568.048	614.543	614.652
Depreciation	355.541	380.175	396.086	405.918
Return on Assets	734.335	770.132	787.176	796.495
Gross Cost of Service	**1653.992**	**1718.354**	**1797.805**	**1817.065**
Deferred & Transfer Revenue (annuity)	-103.925	-45.866	-79.820	-83.927
Government Cash Contribution (CSO)	-117.460	-116.307	-132.098	-147.242
Additional Revenue	-80.712	-65.378	-63.955	-62.383
Net Cost of Service	**1351.896**	**1490.803**	**1521.932**	**1523.514**
Revenue Requirement	**2010**	**2011**	**2012**	**2013**
Net Tariff Revenue	1,128.100	1,177.510	1,211.170	1,245.780
CSO Tariff Discounts	58.609	60.222	61.881	63.583
CSO Exempt Customers	32.427	30.523	28.582	26.596
CSO Non-Rated Property Discounts	39.496	40.536	41.604	42.740
CSO Transition / Losses	223.971	207.139	190.308	173.476
Net Revenue Requirement	**1,482.600**	**1,515.930**	**1,533.540**	**1,552.170**

12.2 Aqwest

Table 12.2 Corporate Revenue Requirement, Value ($Million, Real Dollars of June 2008) - Aqwest

Asset Account	2010	2011	2012	2013
Opening Asset Value	30.924	33.718	35.509	36.764
Capital Expenditure	3.539	2.533	2.087	2.127
Depreciation	-0.745	-0.743	-0.831	-0.810
Closing Asset Value	**33.718**	**35.509**	**36.764**	**38.081**
Cost of Service	**2010**	**2011**	**2012**	**2013**
Operating Expenditure	4.384	4.364	4.372	4.362
Return on Asset	1.770	1.930	2.033	2.105
Depreciation	0.745	0.743	0.831	0.810
Gross Cost of Service	**6.898**	**7.036**	**7.236**	**7.276**
Other Revenue	-0.466	-0.409	-0.458	-0.405
Net Cost of Service	**6.433**	**6.628**	**6.778**	**6.871**
Revenue Requirement	**2010**	**2011**	**2012**	**2013**
Net Tariff Revenue	**6,339**	**6,497**	**6,659**	**6,824**

12.3 Busselton Water

Table 12.3 Corporate Revenue Requirement, Value ($Million, Real Dollars of June 2008) – Busselton Water

Asset Account	2010	2011	2012	2013
Opening Asset Value	10.998	13.475	17.136	18.766
Capital Expenditure	2.757	3984	2.015	3,.469
Depreciation	-0.281	-0.323	-0.384	-0.415
Closing Asset Value	**13.475**	**17.136**	**18.766**	**21.820**
Cost of Service	**2010**	**2011**	**2012**	**2013**
Operating Expenditure	3.327	3.734	4.114	4.188
Return on Asset	0.630	0.771	0.981	1.074
Depreciation	0.281	0.323	0.384	0.415
Gross Cost of Service	**4.237**	**4.828**	**5.480**	**5.678**
Other Revenue	-0.808	-0.665	-0.804	-0.757
Net Cost of Service	**3.430**	**4.163**	**4.676**	**4.921**
Revenue Requirement	**2010**	**2011**	**2012**	**2013**
Net Tariff Revenue	**3.903**	**3.856**	**3.809**	**3.761**

13 Specific Draft Tariff Recommendations for Each Service Provider

Draft Recommendation

43) 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 H.

PART THREE: IMPACTS OF THE DRAFT RECOMMENDATIONS ON CUSTOMERS, SERVICE PROVIDERS AND GOVERNMENT FINANCES

14 Impacts on Customers

The impacts on customers were discussed in section 2.6.3 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 I. Impacts on a sample of commercial customers are presented in Appendix J. Impacts on Water Corporation country customers are shown in Appendix K.

15 Impacts on the Service Providers

15.1 Water Corporation

As shown in Table 15.1, the Water Corporation's gearing increases from 23 per cent to 39 per cent over the next ten years. However, its net asset position (or equity) improves over this period. Net profit is between $347 million and $510 million per year.

Table 15.1 Summary Financial Indicators for the Water Corporation ($ Million, Real Dollars of June 2008)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Net Profit	479	510	449	437	450	435	416	383	359	347	350
Debt	2,634	3,225	3,494	3,606	3,894	4,427	5,226	5,861	6,279	6,431	6,562
Net Assets	9,058	9,183	9,283	9,398	9,521	9,644	9,766	9,884	10,000	10,116	10,234
Debt/Total Assets	23%	26%	27%	28%	29%	31%	35%	37%	39%	39%	39%
Net Cash from Operating Activities	685	739	720	704	717	712	708	695	689	691	703
Net Cash Used in Investing Activities	-840	-945	-640	-493	-678	-933	-1,214	-1,065	-863	-612	-602

15.2 Aqwest

As shown in Table 15.2, projections for the next ten years indicate that there may be a short period when Aqwest requires debt financing. However, its net asset position improves over the next ten years and its net profit generally remains above $1 million per year.

Table 15.2 Summary Financial Indicators for Aqwest, ($ Million, Nominal Dollars, Year Ending 30 June)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Net Profit	1.366	1.278	1.400	0.966	1.138	1.181	1.083	1.164	1.084	1.404
Debt	0.009	0.009	0.009	0.009	0.009	0.009	2.768	0.558	0.009	0.009
Interest bearing assets	4.691	3.730	3.937	4.273	4.661	0.999	-	-	1.690	4.071
Net Assets	85.454	86.731	88.132	89.098	90.236	91.418	92.501	93.665	94.748	96.153
Debt/Total Assets	0%	0%	0%	0%	0%	0%	3%	1%	0%	0%
Net Cash from Operating Activities	2.934	2.952	3.139	2.755	2.968	3.056	3.065	3.254	3.194	3.533
Net Cash Used in Investing Activities	-6.556	-3.913	-2.932	-2.419	-2.580	-6.717	-6.823	-1.045	-0.955	-1.152

15.3 Busselton Water

As shown in Table 15.3, Busselton Water's net asset position improves over the next ten years. It is expected to have to reduce its interest bearing assets from $9.1 million to zero and will be required to take on debt towards the end of the ten year period. However, the gearing level at 2017/18 is relatively low at 7 per cent. Net profit varies from $0.3 million to $1.3 million.

Table 15.3 Summary Financial Indicators for Busselton Water, ($ Million, Nominal Dollars, Year Ending 30 June)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Net Profit	1.230	1.251	0.839	0.424	0.337	0.494	0.559	0.506	0.422	0.487
Debt	0.011	0.011	0.011	0.011	0.011	0.011	0.011	1.140	3.523	5.264
Interest bearing assets	9.111	8.366	5.710	5.019	2.389	2.000	0.547	-	-	-
Net Assets	60.871	62.122	62.962	63.386	63.723	64.216	64.775	65.281	65.704	66.191
Debt/Total Assets	0%	0%	0%	0%	0%	0%	0%	2%	5%	7%
Net Cash from Operating Activities	2.561	2.222	1.769	1.451	1.378	1.579	1.655	1.632	1.578	1.705
Net Cash Used in Investing Activities	-3.236	-2.967	-4.426	-2.142	-4.008	-1.969	-3.108	-3.308	-3.961	-3.446

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 $271 million over the three years of the regulatory period, in comparison to $262 million in 2008/09.

Table 16.1 Impacts on Government Finances by the Water Corporation ($ million, Real Dollars of June 2008)

	Estimated annual payments for 2008/09	Annual equivalent payments for the period 2010/11 to 2012/13
Dividend payments	354.8	333.15
Tax equivalent payments	205.2	190.98
CSOs	-297.5	-252.74
Net payments to government	**262.4**	**271.40**

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 reduce from an estimated $0.572 million in 2008/09 to $0.495 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 2008/09	Annual equivalent payments for the period 2010/11 to 2012/13
Dividend payments	0.000	0.000
Tax equivalent payments	0.585	0.504
Receipts from State Revenue Office	-0.014	-0.008
Net payments to government	**0.572**	**0.495**

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 decline from an estimated $0.521 million in 2008/09 to $0.23 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 2008/09	Annual equivalent payments for the period 2010/11 to 2012/13
Dividend payments	0.000	0.000
Tax equivalent payments	0.527	0.234
Receipts from State Revenue Office	-0.006	-0.005
Net payments to government	**0.521**	**0.230**

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 draft 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.

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 of Environment) 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".[66] 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.[67]

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.[68]

---

[66] http://www.watercorporation.com.au/C/company_index.cfm?uid=6135-9990-9046-5900

[67] Water Corporation Annual Report 2007, pp 68 - 73.

[68] 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.[69]

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 the Environment 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.[70]

During 2007-08, Busselton Water had total income of approximately $6 million and an after-tax profit of approximately $3 million.[71]

[69] AQWEST *Annual Report 2007*, p22.

[70] ERA, *Final Report on the Inquiry on Urban Water and Wastewater Pricing,* November 2005, pg 151.

[71] Busselton Water *Annual Report 2007*, Financial Statements p2.

19 Appendix C. Current Tariff Structures

This appendix explains how tariffs are currently set for water, wastewater, and drainage.[72] 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.[73]
  - 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).

[72] Other regulated tariffs of the Corporation are outlined in Appendix 3.

[73] 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.[74]
- 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.

[74] 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.[75]

[75] 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. Current Tariff Structure – 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 framework for calculating the short term value of water. It describes a hypothetical wholesale water market which has been based on the Western Australian wholesale electricity market. The market is "solved" to calculate a market clearing price, which represents the value of water in the wholesale market. The Authority invites submissions on the usefulness of this model to provide 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. 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:
  - all suppliers being required to offer their supplies at short run marginal cost.
- The demand schedule is set on the basis of:
  - a bid by the Water Corporation, which incorporates a relatively high bid price for a quantity of demand that is consistent with two day per week restrictions and then lower bid prices for water beyond that level of demand;
  - bids by any other potential purchasers of water for other demand;
- Prior to determining the market clearing price, the market operator calculates the appropriate level of "security purchase", e.g. the amount of water that would need to be retained in the dams. It is referred to as a purchase because it would form part of the demand schedule. An illustrative security purchase is discussed further below.
- The market clearing price is determined at the point where the demand schedule intersects the supply schedule.
- All successful purchasers of water pay the market clearing price and all successful suppliers of water are paid the market clearing price.

21.3 A 5 Year Model of the Wholesale Water Market

A 5 year model has been developed to calculate the market clearing prices from 2008/09 to 2012/13. The model is based on bids and offers and it assumes that the bids and offers for year 1 will also be available to the market in future years. The model then

optimises the security purchases for future years and determines future market clearing prices.

Certain assumptions have been made in the model about demand, supply and the specification of the security assumption.

Demand

It has been assumed that:

- current retail demand in the IWSS under two day per week restrictions is 279 GL and that level of demand grows at 2.4 per cent per year;
- two day per week restrictions are in place for 2008/09 and 2009/10 and then price is used to set demand;
- retail demand above two day per week restrictions has an elasticity of -0.15, which is consistent with research evidence;
- usage charges would need to increase to $2.50 per kL to save the amount of water currently saved with 2 day per week restrictions.

Supply

The following offer prices have been assumed (based on the short run marginal cost of each source):

- dams: $0.10 per kL;
- groundwater: $0.20 per kL;
- desalination 1: $0.31 per kL;
- desalination 2: $0.45 per kL;
- irrigation cooperative: $0.25 per kL;

In addition, it has been assumed that the average inflows of the period from 2001 to 2007 occurs for each of the five years and groundwater of 110 GL per year is available. Actual groundwater available under the groundwater abstraction rule would be higher than this. However, a lower amount has been assumed to account for environmental externalities associated with abstraction from the Gnangara Mound (as discussed in the report).

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).

Security Purchase

For security purposes, it has been assumed that:

- there needs to be enough water left in the dams at the end of each year to ensure demand will be met in the following year in the event that the very low (30 GL) inflows of 2001 happen again; and
- the only non-dam water that can be relied on for the following year is from Water Corporation's groundwater allocation, desalination and existing trades between the Water Corporation and Harvey Water .

21.4 Results

Table 21.1 summarises the results.

Table 21.1 Summary – Five Year Pricing Model of the Whole Sale Water Market 2008/08 – 2012/13

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
Price ($/kL, dollars of 2008/09)	2.44	2.49	1.90	1.51	1.76
Equilibrium Output (GL)	355	358	354	349	356
Demand (GL)					
Restricted demand	279	286	293	300	307
Security Operator	76	72	48	25	32
Unrestricted demand	0	0	14	25	17
Total	355	358	354	349	356
Supply (GL)					
Dams	150	186	182	158	135
Commercial groundwater	147	110	110	110	110
Irrigation Coop1	13	13	13	13	13
Irrigation Coop2	0	4	4	3	3
Desal1	45	45	45	45	45
Desal2	0	0	0	20	50
Augmentation	0	0	0	0	0
Total	355	358	354	349	356

The price is maintained at around $2.50 per kL for the first two years. Thereafter, the price falls in anticipation of the second desalination plant and then falls further (to around $1.50 per kL) once the plant is operational. The price then increases to hold demand steady in the face of a constant demand growth.

Security Calculation

Table 21.2 shows how the security purchase is calculated. For the purpose of understanding how the security purchase works, look first at the bottom part of year 2 in the figure. In that year, demand is expected to be 286 GL and it is expected that there is 110 GL of groundwater, 45 GL of desalinated water, 17 GL of water purchased from Harvey Water and 30 GL of inflows (i.e. assuming a “worst case scenario”). This leaves a residual of 84 GL which would ideally be available in the dams at the end of year 1.

The task for the market operator is to try to achieve this result. The October storage in the top part of the figure for year 1 indicates an opening storage of 150 GL (note that this is available storage rather than actual storage – the lower 110 GL of storage is assumed to be unusable). As all of this storage will be dispatched, and only 30 GL may flow into the

dams, the market operator is required to purchase 54 GL to leave 84 GL in the dams at the end of the year.

Note that for the first two years the security purchases shown in Table 21.2 are lower than the actual security purchases shown in Table 21.1. This indicates that the model has a less conservative security assumption than is currently being applied through water restrictions. If a more conservative assumption were applied, the prices would be higher. (However, the groundwater assumption in the model is conservative and in the event of very low inflows for a year, groundwater could be made available to ease the short term security risk – in return for lower groundwater in the following year).

It may also be noted that the October dam storage in the table is always assumed to be the storage based on the long term inflow assumption (110 GL in this scenario), rather than the storage that would result from a 30 GL inflow.

Table 21.2 Security Purchase 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	186	182	158	135
Less dispatched dam storage	-150	-186	-182	-158	-135
plus inflows	30	30	30	30	30
plus security purchase	54	61	48	25	32
September Dam Storage	84	91	78	55	62
Demand	279	286	293	300	307
less commercial groundwater	-147	-110	-110	-110	-110
less desalination	-45	-45	-45	-65	-95
less irrigation coop	-13	-17	-17	-17	-17
less inflows	-30	-30	-30	-30	-30
Residual	44	84	91	78	55

Dam Storage

Table 21.3 shows the dam storage position for the five year period. For the given inflow assumption (110 GL per year) and for the actual security purchase (explained above) it can be seen that dam storage reduces to a low of 135 GL with the introduction of the second desalination plant.

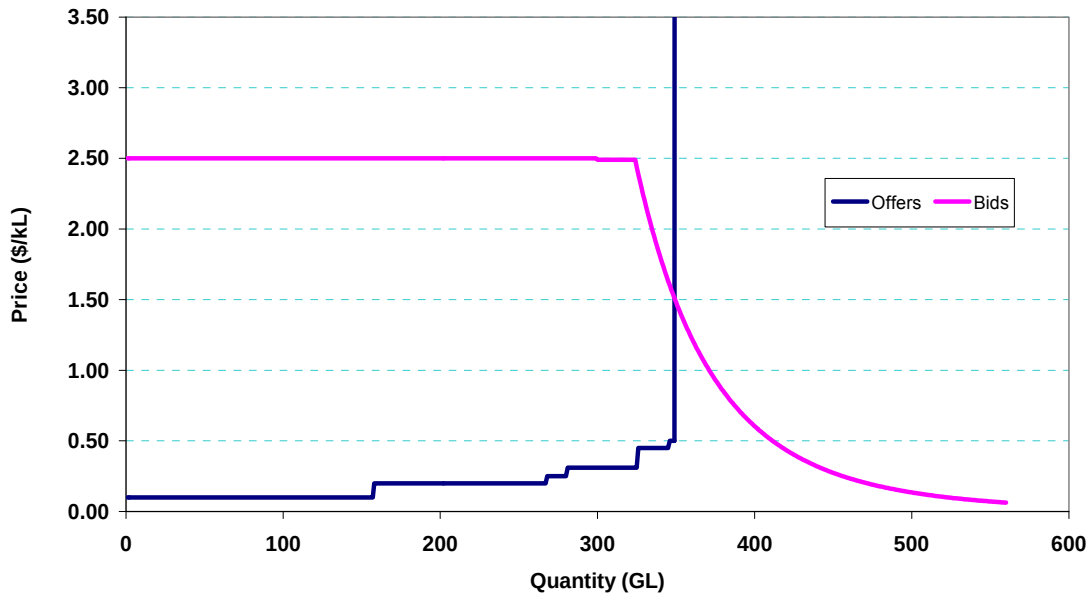
Table 21.3 Dam Storage Position for 2008/09 – 2012/13 (GL)

	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13
October Dam Storage	150	186	182	158	135
less dispatched dam storage	-150	-186	-182	-158	-135
plus inflows	110	110	110	110	110
plus security purchase	76	72	48	25	32
September Dam Storage	186	182	158	135	142

21.5 Market Clearing Price

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 $1.51 per kL, which provides for a degree of unrestricted demand to be met. The supply curve is shown as a horizontal line for the level of restricted demand (with a bid price of $2.50 per kL). The figure shows that demand exceeds supply even with the introduction of the second desalination plant. As indicated in the report, the market clearing price is sensitive to the assumption about the price that is consistent with the level of restricted demand achieved at present.

Figure 21.1 Demand and Supply Curve for 2011/12



21.6 Short Term Value of Water

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 in the scenario above is $1.73 per kL.

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 other two WACC formulae which are also popular on regulators' decisions: (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.[76]

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 businesses asset portfolio. In contrast, non-systematic risk relates to the attributes of a particular asset, with this risk managed by portfolio diversification.

[76] Other models include Arbitrage Pricing Theory, the Fama-French Model and the Dividend Growth Model.

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. 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 days.

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[77] of 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.

[77] 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, as a result, the overall direction is shown more clearly. For simplicity, the Authority adopts the simple moving average in its calculations.

Some recent decisions using the implied yields on 10-year nominal government bonds can be summarised as follows.

- In the 2005 Urban Water report, 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[78], 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[79], 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.

However, this current practice is being challenged by a view from a recently released report from the AER.

In December 2008, in its draft recommendations for electricity, the AER[80] 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.

> A term of the risk free proxy which matches the length of the regulatory period (i.e. 5 years) better reflects the financing strategies of regulated energy network businesses.
>
> …
>
> Relative to a term assumption consistent with the length of the regulatory period (i.e. 5 years), the current 10 year term assumption is expected to result in net overcompensation on average, given the risk faced over the regulatory period. In other words, the use of a 10 year term assumption is expected to violate the 'present value principle'. The empirical evidence indicates that the extent of overcompensation on the cost of debt is expected to be around 40 basis points on average.

and

> An averaging period of between 10 and 40 business days in length will be accepted as reasonable.

The rationale for this proposal, including the recent evidence[81], 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

[78] 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*.

[79] 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.*

[80] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers* (p.134).

[81] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers* (p.128).

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.
- 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.

Recommendation

The risk free rate will be calculated using the market data prevailing at the time that the Authority provides its final advice in June 2009. For this draft decision, the Authority has adopted a nominal risk free rate of **4.08 per cent**, based on a 20 trading days average for 10 year Commonwealth bonds, which is consistent with the approach used in previous decisions.

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 are usually used 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 thus is 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 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.[82]

Regulated businesses have previously taken the view that the MRP should be determined solely on the basis of observed historical equity premium, 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 can be found as follows.

[82] 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[83], 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 draft determination for electricity transmission and distribution from the AER.[84,85,86,87,88] This is confirmed with the previously adopted values for market risk premium for utility sector in Australia in recent years.

[83] KPMG (July 2008), *Western Power, Weighted Average Cost of Capital,* a report to Western Power.

[84] IPART (2008), *Review of Prices for Sydney Water Corporation's Water, Sewerage, Stormwater and Other Services, From 1 July 2008, Water — Final Determination and Draft Report June 2008*.

[85] ICRC (December 2007), *Water and Wastewater Price Review, Draft Report and Price Determination*, Report 11 of 2007.

[86] 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.*

Table 22.2 Previously Adopted Value of 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, December 2008.

Even though it is strongly argued that the MRP should be increased from 6 per cent to 7 per cent[89], in its draft determination of WACC parameters for electricity, the AER proposed an MRP of 6 per cent as per previous decisions from regulators around Australia. This proposal was based on the following grounds:

- Brailsford et al[90] 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. That means historical estimates over the periods considered are more likely to overstate, rather than understate, a forward-looking MRP.

In addition, the following grounds can also be considered strong evidence which form the AER's proposal:

- 6 per cent is the most commonly adopted value of a 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.

[87] 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.
[88] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers*.
[89] 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.
[90] 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

Recommendation

Based on this evidence, the Authority proposes to adopt the market risk premium of **6.00%** for the purpose of calculating the rate of return on capital to apply for Water Corporation, Bunbury and Busselton Water Boards.

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 $\beta_e = \mathrm{cov}\left(r_i, r_M\right)/\mathrm{var}\left(r_M\right)$; and $\left(R_m - R_f\right)$ is the market risk premium.

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 the 60/40 gearing. 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 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 have been generally set within the band of 0.9-1.0 with the assumption of 60/40 gearing, which is widely adopted among regulators in Australia, which could be shown Table 22.3 in below.

Table 22.3 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 December 2008, equity beta was set at 0.8 for electricity (both transmission and distribution). By adopting the equity beta of 0.8, the AER views 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[91].

> … 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 equity beta of 0.8 is supported by the empirical evidence conducted by the AER which 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 post 'technology bubble') to 0.68 (average portfolio estimated by the ACG for the Joint Industry Associations using a 5-year estimation period.

In the 2005 Urban Water Inquiry, the Authority assumed an equity beta of 0.8 for the Water Corporation assuming gearing 60/40; and 0.6 for the water boards with the assumption of lower gearing ratio 40/60. 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).

The Authority is not convinced with the view from Water Corporation that equity beta should be set 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*

[91] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers*.

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.

It is widely accepted that businesses water industry are less risky than those in the utility sector. In addition, water industry in the west of Australia may even less risky in comparison with the east. This view could be grounded in terms of a number of service providers in Western Australia, demand structure, natural resources (groundwater), and also with financing issue.

Recommendation

The Authority proposes to adopt an equity beta of **0.65** for Water Corporation, and **0.63** for Aqwest and Busselton Water.[92] 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 Water Corporation, Aqwest and Busselton Water would be consistent with a decision by the ESC in June 2008 on Victorian non-metropolitan water prices.

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 which is possibly used to estimate the cost of debt: (i) the estimate of a weighted average of the existing cost of debt of the regulated business; (ii) the marginal rate at which a "comparable" company can raise debt to finance the economic activities; and (iii) 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 which are discussed in turn.

- an interest rate premium over the risk free rate; and
- an allowance for transaction costs incurred in arranging the debt facilities, including gross underwriting and credit rating fees.

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 is a good source of information instead.

[92] For AQWEST and Busselton Water, an equity beta value of 0.57 at 40 per cent gearing is equivalent to an equity beta of 0.65 for the Water Corporation at 60 per cent gearing.

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: (i) the credit rating of these businesses; and (ii) 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. 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 gross underwriting or arrangement fee, legal, road show 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 to minimise inefficient debt financing from regulated businesses.

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 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 draft determination for electricity, the AER[93] argues 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 from various regulators for utility sector, credit ratings are assumed as in Table 22.4. Credit ratings for water and utility sector have been mainly assumed at BBB+, with the only exception of A- in recently released report from the AER.

[93] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers* (p.33).

Table 22.4 Debt Rating for Utility Companies in Australia

Company	Date	Regulator	Assumed credit rating
Electricity transmission and distribution (Draft determination)	December 2008	AER	A-
Metropolitan Melbourne Water Price Review	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 draft determination of WACC for electricity, the AER considered that the median credit rating is 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 a recent rail determination[94], 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. In addition, the Authority provided for debt raising costs of 12.5 basis points.

As previously discussed, it is widely accepted that the water industry is less risky than the broader utility sector. Together with the analysis from the AER in its recently released report in December 2008, this leads to the view that it is inappropriate to assume a credit

[94] 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.*

rating for water industry in the West to be the same at BBB+. As a result, the Authority proposes that the credit rating for the Water Corporation and water boards should be at A-, upgrading from the BBB+ in its previous decision in 2005.

Recommendation

The Authority proposes a cost of debt of **3.075 per cent,** for the Water Corporation, Aqwest and Busselton, which include a debt margin of 295 basis points and debt issuing cost of 12.5 basis points.

These costs of debt will be updated when the Authority makes its final decision in June 2009.

Benchmark Financing Structure: Debt versus Equity

Introduction

The relative proportions of debt, equity, and other securities that a firm has outstanding constitute its capital structure. It is obvious that capital structure choices across industries are different. The same conclusion can be reached for the capital structure for companies within industries. With the assumption on perfect capital markets, Modigliani and Miller (1958)[95][96] developed two influential propositions, known as MMs:

(i) **MM I**: *In a perfect capital market[97], the total value of a firm is equal to the market value of the free cash flows generated by its assets and is not affected by its choice of capital structure.* This means that:

$$V^L = E + D = V^U.$$

This equation simply means that the total value of the firm is the same with or without leverage.

(ii) **MM II**: *The cost of capital of levered equity is equal to the cost of capital of unlevered equity plus a premium that is proportional to the debt-equity ratio (measured using market values).* This means that:

$$R_E = R_U + \frac{D}{E} \times \left(R_U - R_D\right).$$

However, in the real world, the capital markets are not perfect. With the presence of interest tax shield, the firm's choices of capital structure can affect the taxes that it must pay and therefore its value to investors. As a result, in the presence of taxes, MM proportion (I) now becomes:

$$V^L = V^U + PV\left(\text{Interest tax shield}\right).$$

[95] F. Modigliani and M. Miller, "The cost of capital, corporate finance and the theory of investment," *American Economic Review* 48 (3) (1958): 261 – 297.

[96] Modigliani won the Nobel Prize in 1985 for his work on personal savings and for his capital structure theorems with Miller. Miller earned his Nobel Prize in 1990 for his analysis of portfolio theory and capital structure.

[97] A perfect capital market is a market in which : (i) securities are fairly priced; (ii) no tax consequences or transaction costs; and (iii) investment cash flows are independent of financing choices.

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*) or gearing ratio of 60 per cent, with an equity-to-asset (*E/V*) ratio of 40 per cent. Table 22.5 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 22.5 Previously Adopted Values for Level of Gearing

Service provider	Source	Level of gearing
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 (December 2008)

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.

For the water boards, the Authority assumed a gearing ratio of 40 per cent, given the relatively small sizes of the businesses and the exposure of the businesses to cost variations.

Recommendation

The Authority proposes to adopt the gearing of **60 per cent** (i.e. 60/40 for D/E) for the purpose of calculating the rate of return on capital to apply for Water Corporation, and **40 per cent** (40/60 for D/E) for Bunbury 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

Inflation rate plays a crucial role in a determination of values for selected WACC parameters as it is used to calculate the real risk free rate from the nominal risk free rate, using the Fisher's formula.

Proposals by Service Providers

Water Corporation has proposed that, from the nominal risk free rate as 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 AER released its determination on SP Ausnet[98] to adopt RBA's short term inflation forecasts of 2.6 per cent. In addition, on the evidence used in the AER's and the ESC decision, the ERA's draft decision for the Freight and Urban Rail networks[99] uses an inflation forecast of 2.5 per cent.

The Reserve Bank's statement on monetary policy[100] forecasts the year-on-year change in the CPI to be (i) 4.5 per cent by the end of 2008; (ii) 3.25 per cent by the end of 2009, and (iii) 2.75 per cent by the end of 2010.

However, as in the Reserve Bank's latest statement on monetary policy[101] in November 2008, the financial crisis has materially altered the balance of risks and this has raised the prospect that global economic conditions could be significantly weaker than previously assumed. As a result, the RBA then forecasts that

> "inflation was likely to decline gradually over time, and that this allowed scope to begin moving the cash rate towards a less restrictive setting".

and

> "global economic conditions could mean weaker prospects for demand and output in Australia, and greater downward pressure on inflation over time….. the Board will be

[98] AER, Final Decision: *SP Ausnet Transmission Determination 2008/09 to 2013/14*, January 2008, pp 105-106

[99] ERA, Draft Determination, *2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway networks*, April 2008, pp 9 - 12.

[100] RBA, *Statement on Monetary Policy*, 9 May 2008, p 68.

[101] RBA, *Statement on Monetary Policy*, 10 November 2008, p 4.

seeking to strike the appropriate balance between avoiding an unduly sharp weakening in demand and the need for inflation to fall back to the target over a reasonable period".

Recommendation

The Authority proposes to adopt the inflation rate of **2.5 per cent** (the midpoint of Reserve Bank's inflation target) for the purpose of calculating the rate of return on capital to apply for Water Corporation, Bunbury and Busselton Water Boards.

Corporate Tax Rate

Introduction

The corporate tax rate plays an important role to show the connection between pre-tax WACC and 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.[102] 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 was adopted in Australia since July 1, 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 for corporate taxation paid at the company level when determining their personal income taxation liabilities. In a dividend imputation tax system, the proportion of company tax that can be fully rebated (credited) against personal tax

[102] See IPART (2002), *Weighted Average Cost of Capital: Discussion Paper*.

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.

The actual value of franking credits, represented in the WACC by the parameter 'gamma', which is discussed in Section 5.5 below, 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 theory and evidence on the value of franking credits. The Authority is left with a need to make a determination on the value of gamma to be applied in the WACC determination with the major conceptual issues unresolved.

Recent regulatory decisions have employed a gamma value of 0.5 from many regulators across Australia, such as ESC (2008)[103]; OTTER (2007)[104]; QCA (2006)[105]; except for IPART, which continues to use a range between 0.3 and 0.5.

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.[106]

Recommendation

The Authority proposes to adopt the value of imputation credit of **0.5** for the purpose of calculating the rate of return on capital to apply for Water Corporation, Bunbury and Busselton Water Boards.

---

[103] ESC, *Gas access arrangement review 2008-2012*, Final decision – Public version, 7 March 2008, pp.499-509

[104] OTTER, *Investigation of prices for electricity distribution services and retail tariffs on mainland Tasmania* – Final report and proposed maximum prices, September 2007, p.152.

[105] 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

[106] AER (December 2008), Draft decision, *Review of the weighted average cost of capital parameters for electricity transmission and distribution network service providers* (p.290).

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).

- 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;[107] and

[107] T_c refers to the company tax rate.

- the pre-tax nominal WACC is then adjusted for inflation to obtain the pre-tax real WACC.

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[108] 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.

[108] 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 22.6 Proposed WACC Parameters for Water Corporation, Aqwest and Busselton Water

Parameter	Current Decision (Nov 2005)		Water Corporation's Proposal (September 2008)			Authority's Draft Decision (30 January 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%	**4.08%**	**4.08%**
Real Risk Free Rate)	2.42%	2.42%	3.49%	3.49%	3.49%	**1.54%**	**1.54%**
Inflation Rate	2.74%	2.74%	2.75%	2.75%	2.75%	**2.50%**	**2.50%**
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%	**2.95%**	**2.95%**
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%	**3.075%**	**3.075%**
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**	**0.62**
Corporate Tax Rate	30%	30%	30%	30%	30%	**30%**	**30%**
Franking Credit	50%	50%	50%	50%	50%	**50%**	**50%**
Nominal Pre Tax WACC	8.53%	8.77%	9.80%	10.59%	11.02%	**8.05%**	**8.37%**
Real Pre Tax WACC	**5.63%**	**5.87%**	**6.87%**	**7.63%**	**8.05%**	**5.41%**	**5.72%**

23 Appendix G. Cost-Effectiveness of Rebates

The following table summarises the different types of rebate products and maximum rebates.

Table 23.1 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).[109] 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.[110] 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 23.2). 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.

[109] 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.

[110] Marsden Jacob Associates (March 2007), *The Cost-Effectiveness of Rainwater Tanks in Urban Australia*, a study carried out for the National Water Commission.

Table 23.2 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

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.[111]

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.

[111] 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.

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. 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 23.3 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 23.4 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

24 Appendix H. Schedules of Prices

Schedule 1: Recommended Price Paths for Water and Wastewater Services – Water Corporation

Table 24.1 Recommended Water Corporation Metropolitan Residential and Commercial Water Tariffs (Real Dollar Value of June 2008)

	2009	2010	2011	2012	2013
Residential Fixed Charge					
Fixed Tariff	176.10	168.11	160.12	152.14	144.15
Residential Demand Charge by Volume					
0 – 150	0.627	0.753	0.879	1.004	1.130
151 – 200	0.808	1.038	1.269	1.499	1.730
201 – 250	0.808	1.038	1.269	1.499	1.730
251 – 300	0.808	1.038	1.269	1.499	1.730
301 – 350	0.808	1.038	1.269	1.499	1.730
351 – 400	0.973	1.162	1.351	1.541	1.730
401 – 450	0.973	1.162	1.351	1.541	1.730
451 – 500	0.973	1.162	1.351	1.541	1.730
501 – 550	0.973	1.372	1.771	2.171	2.570
551 – 650	1.388	1.684	1.979	2.275	2.570
651 – 750	1.388	1.684	1.979	2.275	2.570
750 – 950	1.388	1.684	1.979	2.275	2.570
951 – 1150	1.672	1.897	2.121	2.346	2.570
1150 – 1550	1.672	1.897	2.121	2.346	2.570
1550 – 1950	1.672	1.897	2.121	2.346	2.570
>1950	1.672	1.897	2.121	2.346	2.570
Commercial Fixed Charge by Meter Size					
20mm	488.10	453.70	419.31	384.91	350.52
25mm	762.63	708.91	655.17	601.43	547.68
30mm	1,098.54	1,020.83	943.44	866.05	788.66
40mm	1,952.20	1,814.80	1,677.23	1,539.65	1,402.07
50mm	3,050.73	2,835.63	2,620.67	2,405.70	2,190.74
80mm	7,809.76	7,259.22	6,708.90	6,158.59	5,608.28
100mm	12,201.95	11,342.52	10,482.66	9,622.80	8,762.94
150mm	27,455.61	25,520.68	23,585.99	21,651.31	19,716.62
200mm	48,809.76	45,370.10	41,930.66	38,491.21	35,051.77
250mm	76,265.37	70,890.78	65,516.65	60,142.52	54,768.39
300mm	109,821.46	102,082.72	94,343.97	86,605.23	78,866.48
350mm	149,479.02	138,945.92	128,412.63	117,879.34	107,346.04
20mm meter (Strata)	176.10	168.11	160.12	152.14	144.15
Commercial Demand Charge by Volume (kL)					
0 – 600	0.959	1.345	1.730	1.730	1.730
601 – 1,100,000	1.018	1.374	1.730	1.730	1.730
over 1,100,000	1.003	1.366	1.730	1.730	1.730

Table 24.2 Recommended Water Corporation Metropolitan Residential and Commercial Water Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2009	2010	2011	2012	2013
Residential Fixed Charge					
Fixed Tariff	180.50	176.62	172.44	167.93	163.09
Residential Demand Charge by Volume (kL)					
0 - 150	0.643	0.791	0.946	1.109	1.278
151 - 200	0.828	1.091	1.366	1.655	1.957
201 - 250	0.828	1.091	1.366	1.655	1.957
251 - 300	0.828	1.091	1.366	1.655	1.957
301 - 350	0.828	1.091	1.366	1.655	1.957
351 - 400	0.997	1.221	1.455	1.701	1.957
401 - 450	0.997	1.221	1.455	1.701	1.957
451 - 500	0.997	1.221	1.455	1.701	1.957
501 - 550	0.997	1.441	1.908	2.396	2.908
551 - 650	1.423	1.769	2.131	2.511	2.908
651 - 750	1.423	1.769	2.131	2.511	2.908
750 - 950	1.423	1.769	2.131	2.511	2.908
951 - 1150	1.714	1.993	2.284	2.589	2.908
1150 - 1550	1.714	1.993	2.284	2.589	2.908
1550 - 1950	1.714	1.993	2.284	2.589	2.908
>1950	1.714	1.993	2.284	2.589	2.908
Commercial Fixed Charge by Meter Size (mm)					
20	500.30	476.67	451.55	424.87	396.58
25	781.70	744.80	705.54	663.86	619.65
30	1,126.00	1,072.51	1,015.98	955.96	892.30
40	2,001.00	1,906.68	1,806.19	1,699.48	1,586.31
50	3,127.00	2,979.18	2,822.17	2,655.44	2,478.62
80	8,005.00	7,626.71	7,224.76	6,797.94	6,345.26
100	12,507.00	11,916.74	11,288.68	10,621.77	9,914.47
150	28,142.00	26,812.66	25,399.54	23,898.99	22,307.55
200	50,030.00	47,666.96	45,154.73	42,487.10	39,657.86
250	78,172.00	74,479.62	70,554.26	66,386.09	61,965.41
300	112,567.00	107,250.66	101,598.14	95,595.97	89,230.19
350	153,216.00	145,980.06	138,286.36	130,116.73	121,452.20
20mm meter (Strata)	180.50	176.62	172.44	167.93	163.09
Commercial Demand Charge by Volume (kL)					
0 – 600	0.983	1.413	1.863	1.910	1.957
601 – 1,100,000	1.043	1.443	1.863	1.910	1.957
Over 1,100,000	1.028	1.436	1.863	1.910	1.957

Table 24.3 Recommended Water Corporation Metropolitan Residential and Commercial Wastewater Tariffs (Real Dollars of June 2008).

	2009	2010	2011	2012	2013
Residential Fixed Charge					
Average Fixed Tariff	529.70	515.61	501.51	487.42	473.32
Commercial Fixed Charge					
First Fixture	593.07	554.70	518.81	485.24	453.85
Second Fixture	253.85	237.43	222.07	207.70	194.26
Third Fixture	339.02	317.09	296.57	277.38	259.44
Over 3 Fixtures (each)	368.59	344.74	322.43	301.57	282.06
Strata Title	368.59	344.74	322.43	301.57	282.06
First Fixture, Aged Homes	159.32	149.01	139.37	130.35	121.92
Over 1 Fixture, Aged Homes	70.05	65.52	61.28	57.31	53.60
First Fixture, Exempt & Charitable	159.32	149.01	139.37	130.35	121.92
Vacant land	202.44	189.34	177.09	165.63	154.92
Commercial Demand Charge					
>200kL	2.18	2.04	1.91	1.78	1.67

Table 24.4 Recommended Water Corporation Metropolitan Residential and Commercial Wastewater Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2009	2010	2011	2012	2013
Residential Fixed Charge					
Average Fixed Tariff	542.95	541.71	540.07	538.02	535.52
Commercial Fixed Charge					
First Fixture	607.90	582.78	558.70	535.62	513.48
Second Fixture	260.20	249.45	239.14	229.26	219.79
Third Fixture	347.50	333.14	319.38	306.18	293.53
Over 3 Fixtures (each)	377.80	362.19	347.22	332.88	319.12
Strata Title	377.80	362.19	347.22	332.88	319.12
First Fixture, Aged Homes	163.30	156.55	150.08	143.88	137.94
Over 1 Fixture, Aged Homes	71.80	68.83	65.99	63.26	60.65
First Fixture, Exempt & Charitable	163.30	156.55	150.08	143.88	137.94
Vacant land	207.50	198.93	190.71	182.83	175.27
Commercial Demand Charge					
>200kL	2.23	2.14	2.05	1.97	1.89

Table 24.5 Residential Usage Charges for Country Towns (Real Dollars of June 2008)

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**	**551-950**	**951+**
Towns in North	**1-350**	**351-500**	**501-750**	**751-1150**	**1151+**
Group 1	0.30	0.30	0.30	0.30	0.30
Group 2	0.37	0.37	0.37	0.37	0.37
Group 3	0.45	0.45	0.45	0.45	0.45
Group 4	0.56	0.56	0.56	0.56	0.56
Group 5	0.68	0.68	0.68	0.68	0.68
Group 6	0.84	0.84	0.84	0.84	0.84
Group 7	1.03	1.03	1.03	1.03	1.03
Group 8	1.13	1.26	1.26	1.26	1.26
Group 9	1.13	1.55	1.55	1.55	1.55
Group 10	1.13	1.73	1.79	1.85	1.91
Group 11	1.13	1.73	1.93	2.14	2.34
Group 12	1.13	1.73	2.11	2.50	2.88
Group 13	1.13	1.73	2.33	2.93	3.54
Group 14	1.13	1.73	2.60	3.47	4.34
Group 15	1.13	1.73	2.93	4.13	5.33

Table 24.6 Area Based Metropolitan Drainage Charges (Real Dollars of June 2008)

	2010/11 ($/year)
Low (All residential plus non-residential less than 1,000 sqm)	73.17
Medium (non-residential between 1,000 and 10,000 sqm)	365.85
High (non-residential above 10,000 sqm)	731.70

Schedule 2: Recommended Price Paths for Water Services – Aqwest

Table 24.7 Recommended Aqwest Residential and Commercial Water Tariffs (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Fixed Charge					
Residential	96.72	81.64	66.56	51.49	36.41
Non-Residential by Type					
Industrial	212.05	-	-	-	-
Rural	38.37	-	-	-	-
Commercial	365.77	-	-	-	-
Vacant Land	53.22	81.64	66.56	51.49	36.41
Public Facility	278.41	-	-	-	-
Non Rateable	72.35	-	-	-	-
Non-Residential by Meter Size (mm)					
20	289.39	226.14	162.90	99.65	36.41
25	451.11	353.35	254.53	155.71	56.89
40	1,157.55	904.57	651.60	398.62	145.64
50	1,808.68	1,413.40	1,018.12	622.84	227.56
80	4,630.22	3,618.30	2,606.38	1,594.46	582.55
100	7,234.72	5,653.59	4,072.47	2,491.35	910.23
150	16,278.11	12,720.58	9,163.06	5,605.53	2,048.01
Demand Charge by Volume (kL)					
Residential					
0 - 150	0.406	0.462	0.518	0.574	0.630
151 - 350	0.745	0.866	0.987	1.109	1.230
351 - 500	1.064	1.105	1.147	1.188	1.230
501 - 700	1.402	1.569	1.736	1.903	2.070
701 - 1000	1.683	1.780	1.876	1.973	2.070
Over 1000	2.466	2.367	2.268	2.169	2.070
Non-Residential by Tranche					
0 - 100kL	0.648	0.794	0.939	1.085	1.230
over 1000kL	0.969	1.034	1.100	1.165	1.230

Table 24.8 Recommended Aqwest Residential and Commercial Water Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2009	2010	2011	2012	2013
Fixed Charge					
Residential	100.00	87.54	73.51	58.57	42.66
Non-Residential by Type					
Industrial	219.24	-	-	-	-
Rural	39.67	-	-	-	-
Commercial	378.17	-	-	-	-
Vacant Land	55.03	87.54	73.51	58.57	42.66
Public Facility	287.85	-	-	-	-
Non Rateable	74.80	-	-	-	-
Non-Residential by Meter Size (mm)					
20	299.20	242.47	179.90	113.36	42.66
25	466.40	378.86	281.09	177.12	66.65
40	1,196.80	969.88	719.60	453.42	170.63
50	1,870.00	1,515.44	1,124.37	708.47	266.61
80	4,787.20	3,879.53	2,878.39	1,813.69	682.52
100	7,480.00	6,061.77	4,497.49	2,833.89	1,066.44
150	16,830.00	13,638.97	10,119.34	6,376.26	2,399.49
Demand Charge by Volume (kL)					
Residential					
0 - 150	0.420	0.496	0.572	0.653	0.738
151 - 350	0.770	0.929	1.090	1.261	1.441
351 - 500	1.100	1.185	1.267	1.352	1.441
501 - 700	1.450	1.683	1.917	2.165	2.425
701 - 1000	1.740	1.908	2.072	2.245	2.425
Over 1000	2.550	2.538	2.505	2.467	2.425
Non-Residential by Tranche					
0 - 100kL	0.670	0.851	1.037	1.234	1.441
over 1000kL	1.002	1.109	1.214	1.325	1.441

Schedule 3: Recommended Price Paths for Water Services – Busselton Water

Table 24.9 Recommended Busselton Residential and Commercial Water Tariffs (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Fixed Charge					
Residential	112.37	92.89	73.41	53.93	34.45
Non-Residential by Type					
Industrial	71.94	-	-	-	-
Vacant Land	112.37	92.89	73.41	53.93	34.45
Public Facility	112.37	92.89	73.41	53.93	34.45
Non-Residential By Meter Size (mm)					
20	287.70	224.38	161.07	97.76	34.45
25	449.02	350.60	251.68	152.75	53.83
32	647.05	574.42	412.35	250.27	88.19
40	1,151.62	897.54	644.29	391.04	137.79
50	1,798.67	1,402.40	1,006.70	611.00	215.30
80	4,606.41	3,590.15	2,577.16	1,564.17	551.18
100	7,197.35	5,609.62	4,026.82	2,444.02	861.22
150	16,122.50	12,621.64	9,060.34	5,499.04	1,937.74
Demand Charge by Volume (kL)					
Residential					
0 - 150	0.445	0.429	0.413	0.396	0.380
151 - 350	0.626	0.714	0.803	0.891	0.980
351 - 550	0.692	0.764	0.836	0.908	0.980
551 - 750	0.692	0.974	1.256	1.538	1.820
751 - 1150	0.834	1.081	1.327	1.574	1.820
1151 - 1550	1.384	1.493	1.602	1.711	1.820
1551 - 1950	1.962	1.927	1.891	1.856	1.820
Over 1950	2.265	2.154	2.043	1.931	1.820
Non-Residential by Tranche					
0 - 1000kL	0.682	0.757	0.831	0.906	0.980
Over 1000kL	0.976	0.977	0.978	0.979	0.980

Table 24.10 Recommended Busselton Residential and Commercial Water Tariffs (Forecast Nominal Dollar Value, Year Ending 30 June)

	2009	2010	2011	2012	2013
Fixed Charge					
Residential	118.55	99.60	81.07	61.34	40.36
Non-Residential by Type					
Industrial	75.90	-	-	-	-
Vacant Land	118.55	99.60	81.07	61.34	40.36
Public Facility	118.55	99.60	81.07	61.34	40.36
Non-Residential By Meter Size (mm)					
20	303.52	240.58	177.88	111.20	40.36
25	473.72	375.91	277.94	173.75	63.06
32	682.64	615.90	455.38	284.68	103.32
40	1,214.96	962.34	711.53	444.81	161.44
50	1,897.60	1,503.65	1,111.77	695.01	252.25
80	4,859.76	3,849.35	2,846.12	1,779.24	645.77
100	7,593.20	6,014.62	4,447.07	2,780.05	1,009.02
150	17,009.24	13,532.89	10,005.90	6,255.12	2,270.29
Demand Charge by Volume (kL)					
Residential					
0 - 150	0.470	0.460	0.456	0.451	0.445
151 - 350	0.660	0.766	0.887	1.014	1.148
351 - 550	0.730	0.819	0.923	1.033	1.148
551 - 750	0.880	1.159	1.466	1.790	2.132
751 - 1150	1.460	1.601	1.769	1.946	2.132
1151 - 1550	2.070	2.066	2.088	2.111	2.132
1551 - 1950	2.390	2.310	2.256	2.197	2.132
Over 1950	2.780	2.607	2.460	2.302	2.132
Non-Residential by Tranche					
0 - 1000kL	0.720	0.811	0.918	1.030	1.148
over 1000kL	1.030	1.048	1.080	1.114	1.148

25 Appendix I. Impacts on Customers

Summary of Impacts of Draft Recommendation on Average Annual Payments for Water Corporation, Aqwest and Busselton Water Customers

The impacts on the average annual payments for Water Corporation, Aqwest and Busselton Water customers are shown for three different tariff options. The tariff options vary in their approach to the allocation of wastewater costs between the Water Corporation's metropolitan residential and non-residential customers. Under the current approach to wastewater charging, it is estimated that in the year 2012/13 metropolitan residential customers would contribute 76 per cent of wastewater revenue, but would account for 82 per cent of estimated discharge to sewers.

- **Option 1** – Metropolitan wastewater costs allocated on the basis of the current tariff structure.
- **Option 2** – Authority's preferred approach: metropolitan wastewater revenue shares in 2012/13 reflect proportion of estimated discharge volume.

The impacts of the Authority's proposed approach to residential wastewater pricing are not shown as there is insufficient data available to model these impacts.

All dollars are in real value of June 2008.

	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structures)				Option 2 (ERA Preferred Option – Wastewater Costs Allocated so that Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Average Annual Payment		Variation ($)	Variation (%)	Average Annual Payment		Variation ($)	Variation (%)
	2008/09	2012/13			2008/09	2012/13		
Household Water Bills								
Water Corporation, Perth	383	545	161	42%	383	545	161	42%
Water Corporation, Country	459	544	85	19%	459	544	85	19%
Aqwest, Bunbury	258	282	25	10%	258	282	25	10%
Busselton Water	274	258	-15	-5%	274	258	-15	-5%
Household Wastewater Bills								
Water Corporation, Perth	530	454	-76	-14%	530	473	-56	-11%
Water Corporation, Country	573	474	-99	-17%	573	517	-56	-10%
Total Household Water and Wastewater Bills								
Water Corporation, Perth	913	998	85	9%	913	1,018	105	11%
Water Corporation, Country	1,031	1,018	-14	-1%	1,031	1,061	29	3%
Commercial Water Bills								
Water Corporation, Perth	1,223	1,677	454	37%	1,223	1,677	454	37%
Water Corporation, Country	8,441	6,724	-1,717	-20%	8,441	6,724	-1,717	-20%
Aqwest, Bunbury	1,455	1,130	-325	-22%	1,455	1,130	-325	-22%
Busselton Water	564	416	-148	-26%	564	416	-148	-26%
Commercial Wastewater Bills								
Water Corporation, Perth	996	853	-143	-14%	996	762	-234	-23%
Water Corporation, Country	1,320	1,167	-153	-12%	1,320	747	-573	-43%
Total Commercial Water and Wastewater Bills								
Water Corporation, Perth	2,219	2,530	310	14%	2,219	2,439	220	10%
Water Corporation, Country	9,760	7,891	-1,870	-19%	9,760	7,471	-2,290	-23%

Impacts on Water Corporation Customers

All financial impacts are in real dollar values of 30 June 2008.

Table 25.1 Impacts on Metropolitan Residential Customers

	2009	2010	2011	2012	2013
Water Payment					
50kL/annum	207	206	204	202	201
100kL/annum	239	243	248	253	257
150kL/annum	270	281	292	303	314
200kL/annum	311	333	355	378	400
250kL/annum	351	385	419	453	487
300kL/annum	391	437	482	528	573
350kL/annum	432	489	546	603	660
400kL/annum	480	547	613	680	746
450kL/annum	529	605	681	757	833
500kL/annum	578	663	748	834	919
550kL/annum	626	732	837	942	1,048
600kL/annum	696	816	936	1,056	1,176
650kL/annum	765	900	1,035	1,170	1,305
700kL/annum	835	984	1,134	1,283	1,433
750kL/annum	904	1,068	1,233	1,397	1,562
Water Payment Annual Variation					
50kL/annum		-2	-2	-2	-2
100kL/annum		5	5	5	5
150kL/annum		11	11	11	11
200kL/annum		22	22	22	22
250kL/annum		34	34	34	34
300kL/annum		45	45	45	45
350kL/annum		57	57	57	57
400kL/annum		66	66	66	66
450kL/annum		76	76	76	76
500kL/annum		85	85	85	85
550kL/annum		105	105	105	105
600kL/annum		120	120	120	120
650kL/annum		135	135	135	135
700kL/annum		150	150	150	150
750kL/annum		164	164	164	164
Water Payment Annual Variation (%)					
50kL/annum		-0.82%	-0.83%	-0.83%	-0.84%
100kL/annum		1.92%	1.88%	1.85%	1.81%
150kL/annum		4.02%	3.87%	3.72%	3.59%
200kL/annum		7.21%	6.72%	6.30%	5.93%
250kL/annum		9.66%	8.81%	8.10%	7.49%
300kL/annum		11.61%	10.40%	9.42%	8.61%
350kL/annum		13.20%	11.66%	10.44%	9.45%
400kL/annum		13.83%	12.15%	10.83%	9.77%
450kL/annum		14.35%	12.55%	11.15%	10.03%
500kL/annum		14.78%	12.88%	11.41%	10.24%
550kL/annum		16.82%	14.40%	12.59%	11.18%
600kL/annum		17.26%	14.72%	12.83%	11.37%
650kL/annum		17.63%	14.99%	13.03%	11.53%
700kL/annum		17.93%	15.21%	13.20%	11.66%
750kL/annum		18.19%	15.39%	13.34%	11.77%

Table 25.2 Impacts on Metropolitan Pensioners (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
50kL/annum	104	103	102	101	100
100kL/annum	119	122	124	126	129
150kL/annum	135	141	146	151	157
200kL/annum	175	192	209	226	243
250kL/annum	216	244	273	301	330
300kL/annum	168	212	256	300	344
350kL/annum	209	265	320	376	431
400kL/annum	258	323	389	454	519
450kL/annum	307	381	456	531	605
500kL/annum	355	439	524	608	692
550kL/annum	404	508	612	716	820
600kL/annum	474	592	711	830	949
650kL/annum	543	677	810	944	1,077
700kL/annum	612	761	909	1,058	1,206
750kL/annum	682	845	1,009	1,172	1,335
Water Payment Annual Variation					
50kL/annum		-1	-1	-1	-1
100kL/annum		2	2	2	2
150kL/annum		5	5	5	5
200kL/annum		17	17	17	17
250kL/annum		28	28	28	28
300kL/annum		44	44	44	44
350kL/annum		56	56	56	56
400kL/annum		65	65	65	65
450kL/annum		75	75	75	75
500kL/annum		84	84	84	84
550kL/annum		104	104	104	104
600kL/annum		119	119	119	119
650kL/annum		134	134	134	134
700kL/annum		148	148	148	148
750kL/annum		163	163	163	163
Water Payment Annual Variation (%)					
50kL/annum		-0.8%	-0.8%	-0.8%	-0.8%
100kL/annum		1.9%	1.9%	1.8%	1.8%
150kL/annum		4.0%	3.9%	3.7%	3.6%
200kL/annum		9.7%	8.8%	8.1%	7.5%
250kL/annum		13.2%	11.7%	10.4%	9.5%
300kL/annum		26.2%	20.7%	17.2%	14.7%
350kL/annum		26.6%	21.0%	17.4%	14.8%
400kL/annum		25.3%	20.2%	16.8%	14.4%
450kL/annum		24.4%	19.6%	16.4%	14.1%
500kL/annum		23.7%	19.2%	16.1%	13.8%
550kL/annum		25.8%	20.5%	17.0%	14.5%
600kL/annum		25.1%	20.1%	16.7%	14.3%
650kL/annum		24.6%	19.8%	16.5%	14.2%
700kL/annum		24.2%	19.5%	16.3%	14.0%
750kL/annum		24.0%	19.3%	16.2%	13.9%

Table 25.3 Impacts on Metropolitan State Seniors (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
50kL/annum	163	164	164	164	165
100kL/annum	195	201	208	215	221
150kL/annum	226	239	252	265	278
200kL/annum	267	291	315	340	364
250kL/annum	307	343	379	415	451
300kL/annum	215	269	322	376	429
350kL/annum	256	321	386	452	517
400kL/annum	305	380	454	529	604
450kL/annum	354	438	522	606	690
500kL/annum	402	496	590	683	777
550kL/annum	451	565	678	792	905
600kL/annum	521	649	777	905	1,034
650kL/annum	590	733	876	1,019	1,162
700kL/annum	659	817	975	1,133	1,291
750kL/annum	729	902	1,074	1,247	1,420
Water Payment Annual Variation					
50kL/annum		0	0	0	0
100kL/annum		7	7	7	7
150kL/annum		13	13	13	13
200kL/annum		24	24	24	24
250kL/annum		36	36	36	36
300kL/annum		53	53	53	53
350kL/annum		65	65	65	65
400kL/annum		75	75	75	75
450kL/annum		84	84	84	84
500kL/annum		94	94	94	94
550kL/annum		114	114	114	114
600kL/annum		128	128	128	128
650kL/annum		143	143	143	143
700kL/annum		158	158	158	158
750kL/annum		173	173	173	173
Water Payment Annual Variation (%)					
50kL/annum		0.18%	0.18%	0.18%	0.18%
100kL/annum		3.38%	3.27%	3.16%	3.07%
150kL/annum		5.69%	5.38%	5.11%	4.86%
200kL/annum		9.15%	8.38%	7.73%	7.18%
250kL/annum		11.70%	10.48%	9.48%	8.66%
300kL/annum		24.82%	19.89%	16.59%	14.23%
350kL/annum		25.40%	20.25%	16.84%	14.41%
400kL/annum		24.47%	19.66%	16.43%	14.11%
450kL/annum		23.78%	19.21%	16.12%	13.88%
500kL/annum		23.26%	18.87%	15.87%	13.70%
550kL/annum		25.18%	20.11%	16.75%	14.34%
600kL/annum		24.64%	19.77%	16.51%	14.17%
650kL/annum		24.25%	19.52%	16.33%	14.04%
700kL/annum		23.93%	19.31%	16.19%	13.93%
750kL/annum		23.71%	19.17%	16.08%	13.86%

Table 25.4 Impacts on Metropolitan Dual Seniors (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
50kL/annum	119	122	124	126	129
100kL/annum	151	159	168	177	185
150kL/annum	182	197	212	227	242
200kL/annum	223	249	275	302	328
250kL/annum	263	301	339	377	415
300kL/annum	215	269	322	376	429
350kL/annum	256	321	386	452	517
400kL/annum	305	380	454	529	604
450kL/annum	354	438	522	606	690
500kL/annum	402	496	590	683	777
550kL/annum	451	565	678	792	905
600kL/annum	521	649	777	905	1,034
650kL/annum	590	733	876	1,019	1,162
700kL/annum	659	817	975	1,133	1,291
750kL/annum	729	902	1,074	1,247	1,420
Water Payment Annual Variation					
50kL/annum		2	2	2	2
100kL/annum		9	9	9	9
150kL/annum		15	15	15	15
200kL/annum		26	26	26	26
250kL/annum		38	38	38	38
300kL/annum		53	53	53	53
350kL/annum		65	65	65	65
400kL/annum		75	75	75	75
450kL/annum		84	84	84	84
500kL/annum		94	94	94	94
550kL/annum		114	114	114	114
600kL/annum		128	128	128	128
650kL/annum		143	143	143	143
700kL/annum		158	158	158	158
750kL/annum		173	173	173	173
Water Payment Annual Variation (%)					
50kL/annum		1.92%	1.88%	1.85%	1.81%
100kL/annum		5.69%	5.38%	5.11%	4.86%
150kL/annum		8.16%	7.54%	7.01%	6.55%
200kL/annum		11.86%	10.60%	9.58%	8.75%
250kL/annum		14.42%	12.60%	11.19%	10.07%
300kL/annum		24.82%	19.89%	16.59%	14.23%
350kL/annum		25.40%	20.25%	16.84%	14.41%
400kL/annum		24.47%	19.66%	16.43%	14.11%
450kL/annum		23.78%	19.21%	16.12%	13.88%
500kL/annum		23.26%	18.87%	15.87%	13.70%
550kL/annum		25.18%	20.11%	16.75%	14.34%
600kL/annum		24.64%	19.77%	16.51%	14.17%
650kL/annum		24.25%	19.52%	16.33%	14.04%
700kL/annum		23.93%	19.31%	16.19%	13.93%
750kL/annum		23.71%	19.17%	16.08%	13.86%

Table 25.5 Impacts on Metropolitan Tenants (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
50kL/annum	31	38	44	50	57
100kL/annum	63	75	88	100	113
150kL/annum	94	113	132	151	170
200kL/annum	134	165	195	226	256
250kL/annum	175	217	259	301	343
300kL/annum	215	269	322	376	429
350kL/annum	256	321	386	452	517
400kL/annum	305	380	454	529	604
450kL/annum	354	438	522	606	690
500kL/annum	402	496	590	683	777
550kL/annum	451	565	678	792	905
600kL/annum	521	649	777	905	1,034
650kL/annum	590	733	876	1,019	1,162
700kL/annum	659	817	975	1,133	1,291
750kL/annum	729	902	1,074	1,247	1,420
Water Payment Annual Variation					
50kL/annum		6	6	6	6
100kL/annum		13	13	13	13
150kL/annum		19	19	19	19
200kL/annum		30	30	30	30
250kL/annum		42	42	42	42
300kL/annum		53	53	53	53
350kL/annum		65	65	65	65
400kL/annum		75	75	75	75
450kL/annum		84	84	84	84
500kL/annum		94	94	94	94
550kL/annum		114	114	114	114
600kL/annum		128	128	128	128
650kL/annum		143	143	143	143
700kL/annum		158	158	158	158
750kL/annum		173	173	173	173
Water Payment Annual Variation (%)					
50kL/annum		20.0%	16.7%	14.3%	12.5%
100kL/annum		20.0%	16.7%	14.3%	12.5%
150kL/annum		20.0%	16.7%	14.3%	12.5%
200kL/annum		22.6%	18.4%	15.6%	13.5%
250kL/annum		24.0%	19.3%	16.2%	13.9%
300kL/annum		24.8%	19.9%	16.6%	14.2%
350kL/annum		25.4%	20.3%	16.8%	14.4%
400kL/annum		24.5%	19.7%	16.4%	14.1%
450kL/annum		23.8%	19.2%	16.1%	13.9%
500kL/annum		23.3%	18.9%	15.9%	13.7%
550kL/annum		25.2%	20.1%	16.7%	14.3%
600kL/annum		24.6%	19.8%	16.5%	14.2%
650kL/annum		24.2%	19.5%	16.3%	14.0%
700kL/annum		23.9%	19.3%	16.2%	13.9%
750kL/annum		23.7%	19.2%	16.1%	13.9%

Impacts on Metropolitan Non-Residential Water Customers

Table 25.6 Impacts on Metropolitan Non-Residential Water Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
20mm meter & 300kL	776	857	938	904	870
40mm meter & 2ML	3,952	4,545	5,137	5,000	4,862
100mm meter & 20ML	32,518	38,801	45,083	44,223	43,363
150mm meter & 50ML	78,299	94,192	110,086	108,151	106,217
200mm meter & 400ML	455,799	594,865	733,931	730,491	727,052
Vacant Land	176	168	160	152	144
Water Payment Annual Variation					
20mm meter &300kL		81	81	-34	-34
40mm meter & 2ML		593	592	-138	-138
100mm meter & 20ML		6,283	6,282	-860	-860
150mm meter & 50ML		15,894	15,894	-1,935	-1,935
200mm meter & 400ML		139,066	139,066	-3,439	-3,439
Vacant Land		-8	-8	-8	-8
Water Payment Annual Variation (%)					
20mm meter &300kL		10.5%	9.5%	-3.7%	-3.8%
40mm meter &2ML		15.0%	13.0%	-2.7%	-2.8%
100mm meter &20ML		19.3%	16.2%	-1.9%	-1.9%
150mm meter &50ML		20.3%	16.9%	-1.8%	-1.8%
200mm meter &400ML		30.5%	23.4%	-0.5%	-0.5%
Vacant Land		-4.5%	-4.8%	-5.0%	-5.2%

Impacts on Metropolitan Non-residential Wastewater Customers

Table 25.7 Impacts on Metropolitan Non-Residential Wastewater Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
1 Fixture & 250 kL	702	657	614	574	537
1 Fixture & 500 kL	1,247	1,166	1,091	1,020	954
2 Fixtures & 1000 kL	2,591	2,423	2,266	2,120	1,982
2 Fixtures & 5000 kL	11,309	10,577	9,893	9,252	8,654
3 Fixtures & 1000 kL	2,930	2,740	2,563	2,397	2,242
3 Fixtures & 5000 kL	11,648	10,894	10,189	9,530	8,913
4 Fixtures & 1000 kL	3,298	3,085	2,885	2,698	2,524
4 Fixtures & 5000 kL	12,016	11,239	10,512	9,831	9,195
Water Payment Annual Variation					
1 Fixture & 250 kL		-45	-42	-40	-37
1 Fixture & 500 kL		-81	-75	-71	-66
2 Fixtures & 1000 kL		-168	-157	-147	-137
2 Fixtures & 5000 kL		-732	-684	-640	-599
3 Fixtures & 1000 kL		-190	-177	-166	-155
3 Fixtures & 5000 kL		-754	-705	-659	-617
4 Fixtures & 1000 kL		-213	-200	-187	-175
4 Fixtures & 5000 kL		-777	-727	-680	-636
Water Payment Annual Variation (%)					
1 Fixture & 250 kL		-6.5%	-6.5%	-6.5%	-6.5%
1 Fixture & 500 kL		-6.5%	-6.5%	-6.5%	-6.5%
2 Fixtures & 1000 kL		-6.5%	-6.5%	-6.5%	-6.5%
2 Fixtures & 5000 kL		-6.5%	-6.5%	-6.5%	-6.5%
3 Fixtures & 1000 kL		-6.5%	-6.5%	-6.5%	-6.5%
3 Fixtures & 5000 kL		-6.5%	-6.5%	-6.5%	-6.5%
4 Fixtures & 1000 kL		-6.5%	-6.5%	-6.5%	-6.5%
4 Fixtures & 5000 kL		-6.5%	-6.5%	-6.5%	-6.5%

Impacts on Aqwest Customers

Impacts on Aqwest's Residential Customers

Table 25.8 Impacts on Aqwest's Residential Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
Usage = 50 (kL per year)	117	105	92	80	68
Usage = 100	137	128	118	109	99
Usage = 150	158	151	144	138	131
Usage = 200	195	194	194	193	192
Usage = 250	232	238	243	248	254
Usage = 300	269	281	292	304	315
Usage = 350	307	324	342	359	377
Usage = 400	360	379	399	419	438
Usage = 450	413	435	456	478	500
Usage = 500	466	490	514	538	561
Usage = 550	536	568	601	633	665
Usage = 600	606	647	687	728	768
Usage = 650	677	725	774	823	872
Usage = 700	747	804	861	918	975
Usage = 750	831	893	955	1,017	1,079
Water Payment Annual Variation					
Usage = 50		-12	-12	-12	-12
Usage = 100		-9	-9	-9	-9
Usage = 150		-7	-7	-7	-7
Usage = 200		-1	-1	-1	-1
Usage = 250		5	5	5	5
Usage = 300		12	12	12	12
Usage = 350		18	18	18	18
Usage = 400		20	20	20	20
Usage = 450		22	22	22	22
Usage = 500		24	24	24	24
Usage = 550		32	32	32	32
Usage = 600		40	40	40	40
Usage = 650		49	49	49	49
Usage = 700		57	57	57	57
Usage = 750		62	62	62	62
Water Payment Annual Variation (%)					
Usage = 50		-10.5%	-11.7%	-13.3%	-15.3%
Usage = 100		-6.9%	-7.4%	-8.0%	-8.7%
Usage = 150		-4.2%	-4.4%	-4.6%	-4.9%
Usage = 200		-0.3%	-0.3%	-0.3%	-0.3%
Usage = 250		2.3%	2.3%	2.2%	2.2%
Usage = 300		4.3%	4.1%	3.9%	3.8%
Usage = 350		5.7%	5.4%	5.1%	4.9%
Usage = 400		5.5%	5.2%	4.9%	4.7%
Usage = 450		5.3%	5.0%	4.8%	4.5%
Usage = 500		5.1%	4.9%	4.6%	4.4%
Usage = 550		6.0%	5.7%	5.4%	5.1%
Usage = 600		6.7%	6.3%	5.9%	5.6%
Usage = 650		7.2%	6.7%	6.3%	5.9%
Usage = 700		7.7%	7.1%	6.6%	6.2%
Usage = 750		7.5%	6.9%	6.5%	6.1%

Table 25.9 Impacts on Aqwest's Pensioners Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
Usage = 50 (kL/year)	59	52	46	40	34
Usage = 100	69	64	59	54	50
Usage = 150	79	75	72	69	65
Usage = 200	97	97	97	97	96
Usage = 250	116	119	122	124	127
Usage = 300	135	140	146	152	158
Usage = 350	153	162	171	180	188
Usage = 400	158	177	195	213	232
Usage = 450	212	232	253	273	294
Usage = 500	265	288	310	333	355
Usage = 550	336	367	398	429	459
Usage = 600	406	446	485	524	564
Usage = 650	476	524	572	620	667
Usage = 700	547	603	659	715	771
Usage = 750	632	692	753	814	874
Water Payment Annual Variation					
Usage = 50		-6	-6	-6	-6
Usage = 100		-5	-5	-5	-5
Usage = 150		-3	-3	-3	-3
Usage = 200		-0	-0	-0	-0
Usage = 250		3	3	3	3
Usage = 300		6	6	6	6
Usage = 350		9	9	9	9
Usage = 400		18	18	18	18
Usage = 450		21	21	21	21
Usage = 500		23	23	23	23
Usage = 550		31	31	31	31
Usage = 600		39	39	39	39
Usage = 650		48	48	48	48
Usage = 700		56	56	56	56
Usage = 750		61	61	61	61
Water Payment Annual Variation (%)					
Usage = 50		-10.5%	-11.7%	-13.3%	-15.3%
Usage = 100		-6.9%	-7.4%	-8.0%	-8.7%
Usage = 150		-4.2%	-4.4%	-4.6%	-4.9%
Usage = 200		-0.3%	-0.3%	-0.3%	-0.3%
Usage = 250		2.3%	2.3%	2.2%	2.2%
Usage = 300		4.3%	4.1%	3.9%	3.8%
Usage = 350		5.7%	5.4%	5.1%	4.9%
Usage = 400		11.6%	10.4%	9.4%	8.6%
Usage = 450		9.7%	8.8%	8.1%	7.5%
Usage = 500		8.5%	7.9%	7.3%	6.8%
Usage = 550		9.2%	8.4%	7.8%	7.2%
Usage = 600		9.7%	8.8%	8.1%	7.5%
Usage = 650		10.0%	9.1%	8.4%	7.7%
Usage = 700		10.2%	9.3%	8.5%	7.8%
Usage = 750		9.6%	8.8%	8.1%	7.5%

Impacts on Aqwest's Non-residential Customers

Table 25.10 Impacts on Aqwest's Non-Residential Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
Meter = 20mm, Usage = 300kL	699	464	445	425	405
Meter = 25mm, Usage = 800kL	1,184	988	1,006	1,023	1,041
Meter = 40mm, Usage = 2ML	3,958	3,767	3,790	3,813	3,836
Meter = 50mm, Usage = 5ML	6,548	6,344	6,355	6,366	6,378
Meter = 80mm, Usage = 10ML	14,215	13,721	13,441	13,162	12,883
Meter = 100mm, Usage = 20ML	26,510	26,099	25,903	25,707	25,510
Meter = 150mm, Usage = 50ML	64,626	64,196	63,980	63,764	63,548
Water Payment Annual Variation					
Meter = 20mm, Usage = 300kL		-234	-20	-20	-20
Meter = 25mm, Usage = 800kL		-196	18	18	18
Meter = 40mm, Usage = 2ML		-192	23	23	23
Meter = 50mm, Usage = 5ML		-204	11	11	11
Meter = 80mm, Usage = 10ML		-494	-279	-279	-279
Meter = 100mm, Usage = 20ML		-411	-196	-196	-196
Meter = 150mm, Usage = 50ML		-431	-216	-216	-216
Water Payment Annual Variation (%)					
Meter = 20mm, Usage = 300kL		-33.5%	-4.2%	-4.4%	-4.6%
Meter = 25mm, Usage = 800kL		-16.6%	1.8%	1.7%	1.7%
Meter = 40mm, Usage = 2ML		-4.8%	0.6%	0.6%	0.6%
Meter = 50mm, Usage = 5ML		-3.1%	0.2%	0.2%	0.2%
Meter = 80mm, Usage = 10ML		-3.5%	-2.0%	-2.1%	-2.1%
Meter = 100mm, Usage = 20ML		-1.6%	-0.8%	-0.8%	-0.8%
Meter = 150mm, Usage = 50ML		-0.7%	-0.3%	-0.3%	-0.3%

Impacts on Busselton Water Customers

Impacts on Busselton Water's Residential Customers

Table 25.11 Impacts on Busselton Water's Residential Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
Usage = 50 kL per year	135	114	94	74	53
Usage = 100	157	136	115	94	72
Usage = 150	179	157	135	113	91
Usage = 200	210	193	175	158	140
Usage = 250	242	229	216	203	189
Usage = 300	273	264	256	247	238
Usage = 350	304	300	296	292	287
Usage = 400	339	338	338	337	336
Usage = 450	374	376	379	382	385
Usage = 500	408	415	421	428	434
Usage = 550	443	463	484	505	525
Usage = 600	484	517	550	583	616
Usage = 650	526	571	617	662	707
Usage = 700	568	625	683	741	798
Usage = 750	610	680	749	819	889
Water Payment Annual Variation					
Usage = 50		-20	-20	-20	-20
Usage = 100		-21	-21	-21	-21
Usage = 150		-22	-22	-22	-22
Usage = 200		-18	-18	-18	-18
Usage = 250		-13	-13	-13	-13
Usage = 300		-9	-9	-9	-9
Usage = 350		-4	-4	-4	-4
Usage = 400		-1	-1	-1	-1
Usage = 450		3	3	3	3
Usage = 500		7	7	7	7
Usage = 550		21	21	21	21
Usage = 600		33	33	33	33
Usage = 650		45	45	45	45
Usage = 700		58	58	58	58
Usage = 750		70	70	70	70
Water Payment Annual Variation (%)					
Usage = 50		-15.1%	-17.8%	-21.6%	-27.5%
Usage = 100		-13.5%	-15.6%	-18.4%	-22.6%
Usage = 150		-12.2%	-13.9%	-16.2%	-19.3%
Usage = 200		-8.3%	-9.1%	-10.0%	-11.1%
Usage = 250		-5.4%	-5.7%	-6.1%	-6.5%
Usage = 300		-3.2%	-3.3%	-3.4%	-3.5%
Usage = 350		-1.4%	-1.4%	-1.4%	-1.4%
Usage = 400		-0.2%	-0.2%	-0.2%	-0.2%
Usage = 450		0.8%	0.8%	0.8%	0.8%
Usage = 500		1.6%	1.6%	1.6%	1.5%
Usage = 550		4.7%	4.5%	4.3%	4.1%
Usage = 600		6.8%	6.4%	6.0%	5.7%
Usage = 650		8.6%	7.9%	7.4%	6.8%
Usage = 700		10.2%	9.2%	8.4%	7.8%
Usage = 750		11.5%	10.3%	9.3%	8.5%

Table 25.12 Impacts on Busselton Water's Pensioners Customers (Real Dollars of June 2008)

	2009	2010	2011	2012	2013
Water Payment					
Usage = 50 kL/year	67	57	47	37	27
Usage = 100	78	68	57	47	36
Usage = 150	90	79	68	57	46
Usage = 200	105	96	88	79	70
Usage = 250	121	114	108	101	95
Usage = 300	137	132	128	124	119
Usage = 350	152	150	148	146	144
Water Payment Annual Variation					
Usage = 50		-10	-10	-10	-10
Usage = 100		-11	-11	-11	-11
Usage = 150		-11	-11	-11	-11
Usage = 200		-9	-9	-9	-9
Usage = 250		-7	-7	-7	-7
Usage = 300		-4	-4	-4	-4
Usage = 350		-2	-2	-2	-2
Water Payment Annual Variation (%)					
Usage = 50		-15.1%	-17.8%	-21.6%	-27.5%
Usage = 100		-13.5%	-15.6%	-18.4%	-22.6%
Usage = 150		-12.2%	-13.9%	-16.2%	-19.3%
Usage = 200		-8.3%	-9.1%	-10.0%	-11.1%
Usage = 250		-5.4%	-5.7%	-6.1%	-6.5%
Usage = 300		-3.2%	-3.3%	-3.4%	-3.5%
Usage = 350		-1.4%	-1.4%	-1.4%	-1.4%

Impacts on Busselton Water's Non-Residential Customers

Table 25.13 Impacts on Busselton Water's Non-Residential Customers (Real Dollars of June 2008)

		2010	2011	2012	2013
Water Payment					
Meter = 20mm, Usage = 300kL	585	512	484	423	363
Meter = 25mm, Usage = 800kL	1,565	1,547	1,572	1,565	1,558
Meter = 40mm, Usage = 2ML	3,879	3,670	3,505	3,309	3,112
Meter = 50mm, Usage = 5ML	6,479	6,129	5,824	5,487	5,150
Meter = 80mm, Usage = 10ML	14,168	13,203	12,285	11,335	10,386
Meter = 100mm, Usage = 20ML	26,522	24,995	23,516	22,006	20,496
Meter = 150mm, Usage = 50ML	64,736	61,324	57,894	54,433	50,972
Water Payment Annual Variation					
Meter = 20mm, Usage = 300kL		-72	-28	-60	-60
Meter = 25mm, Usage = 800kL		-18	25	-7	-7
Meter = 40mm, Usage = 2ML		-209	-164	-196	-196
Meter = 50mm, Usage = 5ML		-349	-305	-337	-337
Meter = 80mm, Usage = 10ML		-965	-918	-950	-950
Meter = 100mm, Usage = 20ML		-1,527	-1,478	-1,510	-1,510
Meter = 150mm, Usage = 50ML		-3,413	-3,429	-3,461	-3,461
Water Payment Annual Variation (%)					
Meter = 20mm, Usage = 300kL		-12.4%	-5.6%	-12.5%	-14.3%
Meter = 25mm, Usage = 800kL		-1.2%	1.6%	-0.4%	-0.4%
Meter = 40mm, Usage = 2ML		-5.4%	-4.5%	-5.6%	-5.9%
Meter = 50mm, Usage = 5ML		-5.4%	-5.0%	-5.8%	-6.1%
Meter = 80mm, Usage = 10ML		-6.8%	-7.0%	-7.7%	-8.4%
Meter = 100mm, Usage = 20ML		-5.8%	-5.9%	-6.4%	-6.9%
Meter = 150mm, Usage = 50ML		-5.3%	-5.6%	-6.0%	-6.4%

26 Appendix J. Additional Impact Assessments

Customer impacts are shown for three different options, depending on different approaches to the allocation of wastewater costs between residential and non-residential customers. Under the current approach to wastewater charging, it is estimated that in the year 2012/13 metropolitan residential customers would contribute 76 per cent of wastewater revenue, but would account for 82 per cent of estimated discharge to sewers.

- **Option 1** – Metropolitan wastewater costs allocated on the basis of the current tariff structure.
- **Option 2** – Authority's preferred approach: metropolitan wastewater revenue shares in 2012/13 reflect proportion of estimated discharge volume.

The impacts of the Authority's proposed approach to residential wastewater pricing are not shown as there is insufficient data available to model these impacts. Instead, the tables show the average charge for Perth.

Sample Residential Impact Examples

The following tables show the impacts of the Authority's draft recommendations on residential customers in selected suburbs in Perth.

All dollars are in real value of June 2008.

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Cottesloe	24,274		723		24,274		723	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	690.37	1,348.11	657.74	95.3%	690.37	1,348.11	657.74	95.3%
Sewerage	781.35	453.52	-327.83	-42.0%	781.35	473.32	-308.03	-39.4%
Drainage	-	-	-		-	-	-	
Total	1,647.82	1,945.78	297.97	18.1%	1,647.82	1,965.58	317.76	19.3%

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Melville	12,132		464		12,132		464	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	366.54	712.72	346.18	94.4%	366.54	712.72	346.18	94.4%
Sewerage	584.65	453.52	-131.13	-22.4%	584.65	473.32	-111.33	-19.0%
Drainage	-	-	-		-	-	-	
Total	1,127.29	1,310.39	183.10	16.2%	1,127.29	1,330.19	202.90	18.0%

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Clarkson	10,366		231		10,366		231	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	159.53	309.63	150.10	94.1%	159.53	309.63	150.10	94.1%
Sewerage	492.40	453.52	-38.88	-7.9%	492.40	473.32	-19.08	-3.9%
Drainage	-	-	-		-	-	-	
Total	828.03	907.30	79.28	9.6%	828.03	927.10	99.07	12.0%

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Nedlands	22,486		408		22,486		408	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	312.07	615.84	303.77	97.3%	312.07	615.84	303.77	97.3%
Sewerage	752.40	453.52	-298.88	-39.7%	752.40	473.32	-279.08	-37.1%
Drainage	77.00	73.17	-3.83	-5.0%	77.00	73.17	-3.83	-5.0%
Total	1,317.57	1,286.68	-30.89	-2.3%	1,317.57	1,306.48	-11.09	-0.8%

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Safety Bay	8,676		187		8,676		187	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	123.99	233.51	109.52	88.3%	123.99	233.51	109.52	88.3%
Sewerage	412.10	453.52	41.42	10.1%	412.10	473.32	61.22	14.9%
Drainage	59.60	73.17	13.57	22.8%	59.60	73.17	13.57	22.8%
Total	771.78	904.35	132.57	17.2%	771.78	924.15	152.37	19.7%

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Bayswater	11,415		572		11,415		572	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	480.74	960.04	479.30	99.7%	480.74	960.04	479.30	99.7%
Sewerage	573.05	453.52	-119.53	-20.9%	573.05	473.32	-99.73	-17.4%
Drainage	70.60	73.17	2.57	3.6%	70.60	73.17	2.57	3.6%
Total	1,300.49	1,630.88	330.40	25.4%	1,300.49	1,650.68	350.20	26.9%

Suburb	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	GRV ($)		Cons.(kL)		GRV ($)		Cons.(kL)	
Westminster	8,779		312		8,779		312	
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water service	176.10	144.15	-31.95	-18.1%	176.10	144.15	-31.95	-18.1%
Water consumption	224.96	449.76	224.80	99.9%	224.96	449.76	224.80	99.9%
Sewerage	413.60	453.52	39.92	9.7%	413.60	473.32	59.72	14.4%
Drainage	59.60	73.17	13.57	22.8%	59.60	73.17	13.57	22.8%
Total	874.26	1,120.60	246.34	28.2%	874.26	1,140.40	266.14	30.4%

Sample Commercial Impact Examples

Customer impacts are shown for three different options, depending on different approaches to the allocation of wastewater costs between Water Corporation's metropolitan residential and non-residential customers. Under the current approach to wastewater charging, it is estimated that in the year 2012/13 metropolitan residential customers would contribute 76 per cent of wastewater revenue, but would account for 82 per cent of estimated discharge to sewers.

- **Option 1** – Metropolitan wastewater costs allocated on the basis of the current tariff structure.
- **Option 2** – Authority's preferred approach: metropolitan wastewater revenue shares in 2012/13 reflect proportion of estimated discharge volume.

All dollars are in real value of June 2008.

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Shopping Centre	33	50	8,097	83%	33	50	8,097	83%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	1,952.20	1,402.07	-550.12	-28.2%	1,952.20	1,402.07	-550.12	-28.2%
Water Consumption	8,204.07	14,007.81	5,803.74	70.7%	8,204.07	14,007.81	5,803.74	70.7%
Sewerage Service	12,243.51	10,482.68	-1,760.84	-14.4%	12,243.51	9,369.26	-2,874.25	-23.5%
Sewerage Volumetric	14,135.56	12,102.61	-2,032.95	-14.4%	14,135.56	10,817.14	-3,318.42	-23.5%
Drainage	-	-	-		-	-	-	
Total	34,583.14	36,593.10	2,009.96	5.8%	34,583.14	34,194.21	-388.93	-1.1%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Accommodation	17	50	4,896	93%	17	50	4,896	93%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	3,127.00	2,979.18	-147.82	-4.7%	3,127.00	2,979.18	-147.82	-4.7%
Water Consumption	5,070.53	7,048.08	1,977.56	39.0%	5,070.53	7,048.08	1,977.56	39.0%
Sewerage Service	6,346.15	5,433.46	-912.69	-14.4%	6,346.15	4,856.34	-1,489.80	-23.5%
Sewerage Volumetric	9,456.20	8,096.23	-1,359.97	-14.4%	9,456.20	7,236.29	-2,219.91	-23.5%
Drainage	-	-	-		-	-	-	
Total	20,872.87	20,577.77	-295.10	-1.4%	20,872.87	19,140.72	-1,732.16	-8.3%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Hotel	50	80	3,734	90%	50	80	3,734	90%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	8,005.00	7,626.71	-378.29	-4.7%	8,005.00	7,626.71	-378.29	-4.7%
Water Consumption	3,858.56	5,370.94	1,512.38	39.2%	3,858.56	5,370.94	1,512.38	39.2%
Sewerage Service	18,509.46	15,847.47	-2,661.99	-14.4%	18,509.46	14,164.24	-4,345.23	-23.5%
Sewerage Volumetric	6,928.50	5,932.05	-996.44	-14.4%	6,928.50	5,301.98	-1,626.51	-23.5%
Drainage	1,649.55	365.85	-1,283.70	-77.8%	1,649.55	365.85	-1,283.70	-77.8%
Total	30,946.07	27,516.31	-3,429.76	-11.1%	30,946.07	25,203.00	-5,743.07	-18.6%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Restaurant	9	20	913	94%	9	20	913	94%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	476.67	-23.63	-4.7%	500.30	476.67	-23.63	-4.7%
Water Consumption	916.26	1,299.31	383.05	41.8%	916.26	1,299.31	383.05	41.8%
Sewerage Service	3,397.46	2,908.85	-488.62	-14.4%	3,397.46	2,599.88	-797.58	-23.5%
Sewerage Volumetric	1,426.62	1,221.45	-205.17	-14.4%	1,426.62	1,091.71	-334.91	-23.5%
Drainage	-	-	-		-	-	-	
Total	5,740.34	5,429.60	-310.74	-5.4%	5,740.34	4,990.91	-749.44	-13.1%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Office	2	20	799	93%	2	20	799	93%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	476.67	-23.63	-4.7%	500.30	476.67	-23.63	-4.7%
Water Consumption	797.36	1,134.77	337.41	42.3%	797.36	1,134.77	337.41	42.3%
Sewerage Service	846.93	725.12	-121.80	-14.4%	846.93	648.10	-198.82	-23.5%
Sewerage Volumetric	1,189.37	1,018.32	-171.05	-14.4%	1,189.37	910.16	-279.21	-23.5%
Drainage	-	-	-		-	-	-	
Total	2,833.65	2,878.21	44.56	1.6%	2,833.65	2,693.03	-140.62	-5.0%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Hospital	27	50	364	58%	27	50	364	58%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	3,127.00	2,979.18	-147.82	-4.7%	3,127.00	2,979.18	-147.82	-4.7%
Water Consumption	357.81	514.18	156.37	43.7%	357.81	514.18	156.37	43.7%
Sewerage Service	10,032.00	8,589.22	-1,442.78	-14.4%	10,032.00	7,676.92	-2,355.08	-23.5%
Sewerage Volumetric	22.86	19.57	-3.29	-14.4%	22.86	17.49	-5.37	-23.5%
Drainage	1,492.80	365.85	-1,126.95	-75.5%	1,492.80	365.85	-1,126.95	-75.5%
Total	11,905.47	9,488.82	-2,416.65	-20.3%	11,905.47	8,574.43	-3,331.04	-28.0%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Industrial	4	20	388	90%	4	20	388	90%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	476.67	-23.63	-4.7%	500.30	476.67	-23.63	-4.7%
Water Consumption	381.40	548.08	166.68	43.7%	381.40	548.08	166.68	43.7%
Sewerage Service	1,554.54	1,330.97	-223.57	-14.4%	1,554.54	1,189.60	-364.94	-23.5%
Sewerage Volumetric	322.48	276.10	-46.38	-14.4%	322.48	246.77	-75.70	-23.5%
Drainage	63.10	73.17	10.07	16.0%	63.10	73.17	10.07	16.0%
Total	2,321.52	2,228.32	-93.20	-4.0%	2,321.52	2,057.62	-263.90	-11.4%

Industry	Option 1 (Wastewater Costs Allocated on Basis of Current Tariff Structure)				Option 2 (ERA Preferred Approach – Revenue Shares in 2012/13 Reflect Proportion of Discharge)			
	Fixture	Meter Size	Cons. (kL)	Discharge	Fixture	Meter Size	Cons. (kL)	Discharge
Shop	1	20	198	90%	1	20	198	90%
	Average Annual Payment				Average Annual Payment			
	2008/09	2012/13	Increase $	Increase %	2008/09	2012/13	Increase $	Increase %
Water Service	500.30	476.67	-23.63	-4.7%	500.30	476.67	-23.63	-4.7%
Water Consumption	194.63	279.69	85.06	43.7%	194.63	279.69	85.06	43.7%
Sewerage Service	593.07	507.78	-85.29	-14.4%	593.07	453.85	-139.23	-23.5%
Sewerage Volumetric	- 48.89	41.86	7.03	-14.4%	48.89	37.42	11.48	-23.5%
Drainage	-	-	-		-	-	-	
Total	738.81	745.61	6.79	0.9%	738.81	696.12	-42.69	-5.8%

27 Appendix K. Impacts on Country Customers

27.1 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.

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Albany	2	10	350.98	486.65	135.68	39%	7%
Allanooka Farmland	1	9	350.98	469.02	118.04	34%	6%
Allanson	3	13	350.98	486.65	135.68	39%	7%
Arino	5	15	350.98	486.65	135.68	39%	7%
Arrowsmith Farmland	4	15	350.98	486.65	135.68	39%	7%
Augusta	4	14	350.98	486.65	135.68	39%	7%
Australind/Eaton	1	10	350.98	486.65	135.68	39%	7%
Badgingarra	5	15	350.98	486.65	135.68	39%	7%
Bakers Hill	3	11	350.98	486.65	135.68	39%	7%
Balingup	4	15	350.98	486.65	135.68	39%	7%
Ballidu	5	15	350.98	486.65	135.68	39%	7%
Beacon	5	15	350.98	486.65	135.68	39%	7%
Bencubbin	5	15	350.98	486.65	135.68	39%	7%
Beverley	3	14	350.98	486.65	135.68	39%	7%
Bindi Bindi	5	15	350.98	486.65	135.68	39%	7%
Binningup	3	7	350.98	401.63	50.65	14%	3%
Bodallin	3	13	350.98	486.65	135.68	39%	7%
Boddington	3	15	350.98	486.65	135.68	39%	7%
Bolgart	5	15	350.98	486.65	135.68	39%	7%
Borden	5	15	350.98	486.65	135.68	39%	7%
Boyanup	2	11	350.98	486.65	135.68	39%	7%
Boyup Brook	3	15	350.98	486.65	135.68	39%	7%
Bremer Bay	4	15	350.98	486.65	135.68	39%	7%
Bridgetown	4	15	350.98	486.65	135.68	39%	7%
Broad Arrow	5	15	350.98	486.65	135.68	39%	7%
Brookton	4	15	350.98	486.65	135.68	39%	7%

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Broomehill	4	15	350.98	486.65	135.68	39%	7%
Bruce Rock	5	15	350.98	486.65	135.68	39%	7%
Brunswick/Burekup/Roelands	3	11	350.98	486.65	135.68	39%	7%
Bullaring	4	15	350.98	486.65	135.68	39%	7%
Bullfinch	5	15	350.98	486.65	135.68	39%	7%
Bunjil	5	15	350.98	486.65	135.68	39%	7%
Buntine	5	4	350.98	283.11	-67.86	-19%	-4%
Burracoppin	3	13	350.98	486.65	135.68	39%	7%
Calingari	4	15	350.98	486.65	135.68	39%	7%
Capel	1	9	350.98	469.02	118.04	34%	6%
Carnamah	3	13	350.98	486.65	135.68	39%	7%
Caron	5	13	350.98	486.65	135.68	39%	7%
Cervantes	2	7	350.98	401.63	50.65	14%	3%
Chittering/Bindoon	4	15	350.98	486.65	135.68	39%	7%
Collie	2	10	350.98	486.65	135.68	39%	7%
Collie F/L	1	4	350.98	283.11	-67.86	-19%	-4%
Condingup	5	15	350.98	486.65	135.68	39%	7%
Coolgardie	4	15	350.98	486.65	135.68	39%	7%
Coomberdale	5	15	350.98	486.65	135.68	39%	7%
Coorow	3	14	350.98	486.65	135.68	39%	7%
Corrigin	5	15	350.98	486.65	135.68	39%	7%
Cowaramup	4	15	350.98	486.65	135.68	39%	7%
Cranbrook	5	15	350.98	486.65	135.68	39%	7%
Cuballing	4	15	350.98	486.65	135.68	39%	7%
Cunderdin	2	9	350.98	469.02	118.04	34%	6%
Dalwallinu	4	14	350.98	486.65	135.68	39%	7%
Dalyellup	1	11	350.98	486.65	135.68	39%	7%
Dandaragan	5	15	350.98	486.65	135.68	39%	7%
Dardanup	4	15	350.98	486.65	135.68	39%	7%
Darkan	3	15	350.98	486.65	135.68	39%	7%
Dathagnoorara	2	12	350.98	486.65	135.68	39%	7%
Denmark	5	15	350.98	486.65	135.68	39%	7%
Dongara/Deniso	1	5	350.98	314.83	-36.15	-10%	-2%
Donnybrook	2	10	350.98	486.65	135.68	39%	7%
Doodlakine	4	15	350.98	486.65	135.68	39%	7%
Dowerin	3	15	350.98	486.65	135.68	39%	7%

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Dumbleyung	5	15	350.98	486.65	135.68	39%	7%
Dundinin/Harrismith/Jitarning	5	15	350.98	486.65	135.68	39%	7%
Dunsborough/Yallingup	2	6	350.98	353.78	2.81	1%	0%
Dwellingup	4	15	350.98	486.65	135.68	39%	7%
Eneabba	3	14	350.98	486.65	135.68	39%	7%
Eradu	4	15	350.98	486.65	135.68	39%	7%
Esperance	2	8	350.98	440.15	89.17	25%	5%
Frankland	5	15	350.98	486.65	135.68	39%	7%
Gabbadah (Sovereign Hill)	3	15	350.98	486.65	135.68	39%	7%
Geraldton	1	5	350.98	314.83	-36.15	-10%	-2%
Gibson	5	15	350.98	486.65	135.68	39%	7%
Gin Gin	3	15	350.98	486.65	135.68	39%	7%
Gnarabup	2	13	350.98	486.65	135.68	39%	7%
Gnowangerup	5	15	350.98	486.65	135.68	39%	7%
Goomaling	4	15	350.98	486.65	135.68	39%	7%
Grass Patch	5	15	350.98	486.65	135.68	39%	7%
Grass Valley	3	4	350.98	283.11	-67.86	-19%	-4%
Greenbushes	4	15	350.98	486.65	135.68	39%	7%
Greenhead	3	10	350.98	486.65	135.68	39%	7%
Guilderton	3	9	350.98	469.02	118.04	34%	6%
Harvey/Wokalup	1	11	350.98	486.65	135.68	39%	7%
Highbury & Piessville	4	15	350.98	486.65	135.68	39%	7%
Hines Hill	4	15	350.98	486.65	135.68	39%	7%
Hopetoun	4	15	350.98	486.65	135.68	39%	7%
Horrocks	5	15	350.98	486.65	135.68	39%	7%
Hyden	5	15	350.98	486.65	135.68	39%	7%
Jerramungup	5	15	350.98	486.65	135.68	39%	7%
Jurien	1	7	350.98	401.63	50.65	14%	3%
Kalannie	5	15	350.98	486.65	135.68	39%	7%
Kalbarri	1	7	350.98	401.63	50.65	14%	3%
Kalgarin	5	15	350.98	486.65	135.68	39%	7%
Kalgoorlie/Boulder	4	15	350.98	486.65	135.68	39%	7%
Kambalda	2	10	350.98	486.65	135.68	39%	7%
Karakin (Seaview)	3	15	350.98	486.65	135.68	39%	7%
Katanning	4	15	350.98	486.65	135.68	39%	7%

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Katanning Farmland	4	14	350.98	486.65	135.68	39%	7%
Kellerberrin	4	15	350.98	486.65	135.68	39%	7%
Kendenup Farmland	4	14	350.98	486.65	135.68	39%	7%
Kendenup Town	5	15	350.98	486.65	135.68	39%	7%
Kirup	5	15	350.98	486.65	135.68	39%	7%
Kojonup/Muradup	4	15	350.98	486.65	135.68	39%	7%
Kondinin	5	15	350.98	486.65	135.68	39%	7%
Koorda	4	15	350.98	486.65	135.68	39%	7%
Kukerin & Moulyinning	5	15	350.98	486.65	135.68	39%	7%
Kulin	5	15	350.98	486.65	135.68	39%	7%
Kununoppin	5	15	350.98	486.65	135.68	39%	7%
Lake Grace	5	15	350.98	486.65	135.68	39%	7%
Lake King	5	15	350.98	486.65	135.68	39%	7%
Lancelin	3	10	350.98	486.65	135.68	39%	7%
Latham	5	15	350.98	486.65	135.68	39%	7%
Ledge Point	3	7	350.98	401.63	50.65	14%	3%
Leeman	3	12	350.98	486.65	135.68	39%	7%
Mandurah	1	9	350.98	469.02	118.04	34%	6%
Manjimup	3	12	350.98	486.65	135.68	39%	7%
Margaret River	1	10	350.98	486.65	135.68	39%	7%
Marvel Loch	5	14	350.98	486.65	135.68	39%	7%
Meckering	3	13	350.98	486.65	135.68	39%	7%
Merredin	3	11	350.98	486.65	135.68	39%	7%
Merredin Farmlands	5	9	350.98	469.02	118.04	34%	6%
Miling	4	15	350.98	486.65	135.68	39%	7%
Mingenew	3	14	350.98	486.65	135.68	39%	7%
Moora	2	8	350.98	440.15	89.17	25%	5%
Moora/Round Hill	2	8	350.98	440.15	89.17	25%	5%
Moorine Rock	5	15	350.98	486.65	135.68	39%	7%
Morowa	4	15	350.98	486.65	135.68	39%	7%
Mount Barker	4	14	350.98	486.65	135.68	39%	7%
Mount Roe	5	15	350.98	486.65	135.68	39%	7%
Mukinbudin	5	15	350.98	486.65	135.68	39%	7%
Mullayup	5	15	350.98	486.65	135.68	39%	7%
Mullewa Farmland	4	12	350.98	486.65	135.68	39%	7%
Mullewa Town	5	15	350.98	486.65	135.68	39%	7%

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Mullewa/Mingenew	5	15	350.98	486.65	135.68	39%	7%
Munglinup	5	15	350.98	486.65	135.68	39%	7%
Muntadgin	5	15	350.98	486.65	135.68	39%	7%
Myalup	4	15	350.98	486.65	135.68	39%	7%
Nabawa	4	15	350.98	486.65	135.68	39%	7%
Nannup	4	15	350.98	486.65	135.68	39%	7%
Narembeen	5	15	350.98	486.65	135.68	39%	7%
Narngulu	1	1	350.98	219.15	-131.82	-38%	-9%
Narrikup	4	15	350.98	486.65	135.68	39%	7%
Narrogin	3	14	350.98	486.65	135.68	39%	7%
Narrogin Farmland	4	11	350.98	486.65	135.68	39%	7%
New Norcia	5	15	350.98	486.65	135.68	39%	7%
Newdegate	5	15	350.98	486.65	135.68	39%	7%
Nilgen Ocean Farms	1	14	350.98	486.65	135.68	39%	7%
Norseman	5	15	350.98	486.65	135.68	39%	7%
North Dandalup	3	12	350.98	486.65	135.68	39%	7%
Northam	2	11	350.98	486.65	135.68	39%	7%
Northam Farmlands	5	10	350.98	486.65	135.68	39%	7%
Northcliffe	5	15	350.98	486.65	135.68	39%	7%
Northhampton	4	15	350.98	486.65	135.68	39%	7%
Nungarin	5	15	350.98	486.65	135.68	39%	7%
Nyabing	5	15	350.98	486.65	135.68	39%	7%
Ongerup	5	15	350.98	486.65	135.68	39%	7%
Ora Banda UD Extension	5	15	350.98	486.65	135.68	39%	7%
Parkridge	2	11	350.98	486.65	135.68	39%	7%
Pemberton	4	15	350.98	486.65	135.68	39%	7%
Peppermint Grove	4	14	350.98	486.65	135.68	39%	7%
Perenjori	5	15	350.98	486.65	135.68	39%	7%
Pingaring	5	15	350.98	486.65	135.68	39%	7%
Pingelly	4	15	350.98	486.65	135.68	39%	7%
Pingrup	5	15	350.98	486.65	135.68	39%	7%
Pinjarra	1	10	350.98	486.65	135.68	39%	7%
Pithara	4	15	350.98	486.65	135.68	39%	7%
Popanyinning	5	15	350.98	486.65	135.68	39%	7%
Porongorup Town	1	15	350.98	486.65	135.68	39%	7%
Quairading	4	15	350.98	486.65	135.68	39%	7%

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Quinninup	5	15	350.98	486.65	135.68	39%	7%
Ravensthorpe	5	15	350.98	486.65	135.68	39%	7%
Rocky Gully	5	15	350.98	486.65	135.68	39%	7%
Salmon Gums	5	15	350.98	486.65	135.68	39%	7%
Sea Bird	4	15	350.98	486.65	135.68	39%	7%
Southern Cross	3	6	350.98	353.78	2.81	1%	0%
Tambellup	5	15	350.98	486.65	135.68	39%	7%
Tammin	3	13	350.98	486.65	135.68	39%	7%
Three Springs	4	14	350.98	486.65	135.68	39%	7%
Tincurrin	5	15	350.98	486.65	135.68	39%	7%
Toodyay	3	12	350.98	486.65	135.68	39%	7%
Trayning	5	14	350.98	486.65	135.68	39%	7%
Varley	5	15	350.98	486.65	135.68	39%	7%
Wagin	4	15	350.98	486.65	135.68	39%	7%
Walkaway	1	1	350.98	219.15	-131.82	-38%	-9%
Walpole	5	15	350.98	486.65	135.68	39%	7%
Wandering	5	15	350.98	486.65	135.68	39%	7%
Waroona/Hamel	1	15	350.98	486.65	135.68	39%	7%
Watheroo	5	15	350.98	486.65	135.68	39%	7%
Wellstead	5	15	350.98	486.65	135.68	39%	7%
Westonia	4	13	350.98	486.65	135.68	39%	7%
Wickepin	4	15	350.98	486.65	135.68	39%	7%
Widgiemooltha	5	15	350.98	486.65	135.68	39%	7%
Williams	3	14	350.98	486.65	135.68	39%	7%
Wongan Hills	5	15	350.98	486.65	135.68	39%	7%
Woodanilling	4	15	350.98	486.65	135.68	39%	7%
Woodridge	3	15	350.98	486.65	135.68	39%	7%
Wubin	5	15	350.98	486.65	135.68	39%	7%
Wundowie	1	4	350.98	283.11	-67.86	-19%	-4%
Wyalkatchem	4	15	350.98	486.65	135.68	39%	7%
Yalgorup	4	15	350.98	486.65	135.68	39%	7%
Yarloop	2	15	350.98	486.65	135.68	39%	7%
Yealering	4	15	350.98	486.65	135.68	39%	7%
Yerecoin	5	15	350.98	486.65	135.68	39%	7%
York	3	11	350.98	486.65	135.68	39%	7%
Yuna	5	15	350.98	486.65	135.68	39%	7%

Name of Town	Current Class	Proposed Group	Current Average Annual Water Bill (Based on 5 Town Classes)2008/09	Average Water Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Water Bill Between 2008/09 – 2013/14		Average Annual Variation in Water Bill
					($)	(%)	(%)
Broome	1	7	395.66	504.62	108.96	28%	5%
Burrup Ext	3	12	395.66	539.65	143.99	36%	6%
Camballin	5	15	395.66	539.65	143.99	36%	6%
Carnarvon Town	3	13	395.66	539.65	143.99	36%	6%
Cue	4	15	395.66	539.65	143.99	36%	6%
Denham Saline	2	3	395.66	302.55	-93.11	-24%	-5%
Derby	3	10	395.66	539.65	143.99	36%	6%
Exmouth	3	12	395.66	539.65	143.99	36%	6%
Fitzroy Crossing	2	9	395.66	539.65	143.99	36%	6%
Gascoyne Junction	5	15	395.66	539.65	143.99	36%	6%
Halls Creek	4	15	395.66	539.65	143.99	36%	6%
Karratha	3	11	395.66	539.65	143.99	36%	6%
Kununurra	2	8	395.66	539.65	143.99	36%	6%
Lake Argyle	5	15	395.66	539.65	143.99	36%	6%
Laverton	4	15	395.66	539.65	143.99	36%	6%
Leonora	4	15	395.66	539.65	143.99	36%	6%
Marble Bar	5	15	395.66	539.65	143.99	36%	6%
Meekatharra	4	12	395.66	539.65	143.99	36%	6%
Menzies	5	15	395.66	539.65	143.99	36%	6%
Mount Magnet	3	13	395.66	539.65	143.99	36%	6%
Newman	1	7	395.66	504.62	108.96	28%	5%
Nullagine	5	15	395.66	539.65	143.99	36%	6%
Onslow	5	15	395.66	539.65	143.99	36%	6%
Port Hedland	2	11	395.66	539.65	143.99	36%	6%
Roebourne	4	13	395.66	539.65	143.99	36%	6%
Sandstone	5	15	395.66	539.65	143.99	36%	6%
Wiluna	3	15	395.66	539.65	143.99	36%	6%
Wyndham	5	15	395.66	539.65	143.99	36%	6%
Yalgoo	5	15	395.66	539.65	143.99	36%	6%

27.2 Impacts on Country Wastewater Customers

Name of Town	Current Average Annual Wastewater Bill (Based on 5 Town Classes) 2008/09	Average Wastewater Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Wastewater Bill Between 2008/09 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Albany	632	660	28	4%	1%
Augusta	596	651	55	9%	2%
Australind	632	302	-331	-52%	-14%
Beverley	576	583	7	1%	0%
Binningup	671	670	-1	0%	0%
Boddington	620	564	-56	-9%	-2%
Boyanup	665	649	-16	-2%	0%
Bremer Bay	589	514	-75	-13%	-3%
Bridgetown	648	655	7	1%	0%
Broome	586	668	82	14%	3%
Brunswick	469	668	198	42%	7%
Bunbury	588	646	58	10%	2%
Burekup	630	670	40	6%	1%
Busselton	465	288	-177	-38%	-9%
Capel	668	288	-379	-57%	-15%
Carnarvon	641	289	-352	-55%	-15%
Cervantes	670	610	-60	-9%	-2%
Collie	624	585	-39	-6%	-1%
Coral Bay	671	671	-	0%	0%
Corrigin	507	421	-86	-17%	-4%
Cowaramup	670	374	-297	-44%	-11%
Cranbrook	488	295	-193	-39%	-10%
Cunderdin	440	550	110	25%	5%
Dalyellup	579	305	-274	-47%	-12%
Dardanup	670	552	-118	-18%	-4%
Denham	662	288	-374	-56%	-15%
Denmark	618	660	43	7%	1%
Derby	616	670	54	9%	2%
Dongara/Deniso	628	390	-238	-38%	-9%
Donnybrook	654	575	-79	-12%	-3%
Dunsborough	617	670	53	9%	2%
Eaton	647	288	-359	-55%	-15%
Eneabba	650	368	-282	-43%	-11%

Name of Town	Current Average Annual Wastewater Bill (Based on 5 Town Classes) 2008/09	Average Wastewater Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Wastewater Bill Between 2008/09 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Esperance	517	602	85	16%	3%
Exmouth	543	320	-224	-41%	-10%
Fitzroy Crossi	656	659	4	1%	0%
Geraldton WWSc 2	650	368	-282	-43%	-11%
Gnarabup	554	671	117	21%	4%
Gnowangerup	645	388	-258	-40%	-10%
Greenhead	671	288	-382	-57%	-16%
Greenough WWSc	671	402	-269	-40%	-10%
Halls Creek	591	667	76	13%	2%
Harvey	546	628	82	15%	3%
Hopetoun	671	671	-	0%	0%
Horrocks	526	439	-87	-16%	-4%
Jurien	668	436	-232	-35%	-8%
Kalbarri	525	288	-236	-45%	-11%
Kambalda	373	631	258	69%	11%
Karratha	439	418	-21	-5%	-1%
Katanning	400	524	123	31%	6%
Kellerberrin	552	518	-34	-6%	-1%
Kojonup	542	474	-68	-12%	-3%
Kulin	473	390	-82	-17%	-4%
Kununurra	584	671	86	15%	3%
Lake Argyle	671	626	-45	-7%	-1%
Lancelin	671	649	-22	-3%	-1%
Laverton	551	647	96	17%	3%
Ledge Point	664	485	-178	-27%	-6%
Leeman	666	565	-102	-15%	-3%
Leonora	465	620	155	33%	6%
Mandurah	571	402	-169	-30%	-7%
Manjimup	620	621	1	0%	0%
Margaret River	502	670	168	34%	6%
Meckering	459	498	40	9%	2%
Merredin	516	624	108	21%	4%
Mount Barker	624	561	-63	-10%	-2%
Mukinbudin	631	359	-272	-43%	-11%
Nannup	613	521	-92	-15%	-3%
Narembeen	474	401	-73	-15%	-3%

Name of Town	Current Average Annual Wastewater Bill (Based on 5 Town Classes) 2008/09	Average Wastewater Bill in 2013/14 (Based on 15 Town Groups)	Variation in Annual Wastewater Bill Between 2008/09 – 2013/14		Average Annual Variation in Wastewater Bill
			($)	(%)	(%)
Narrogin	405	565	160	40%	7%
Newdegate	514	531	16	3%	1%
Newman	651	585	-66	-10%	-2%
Northam	517	626	109	21%	4%
Onslow	671	288	-382	-57%	-16%
Pemberton	616	534	-82	-13%	-3%
Pingelly	491	405	-86	-18%	-4%
Pinjarra	486	613	127	26%	5%
Port Hedland	668	671	3	0%	0%
Quairading	486	590	104	21%	4%
Roebourne	613	550	-63	-10%	-2%
Sea Bird	671	628	-43	-6%	-1%
South Hedland	651	669	18	3%	1%
Tambellup	390	288	-101	-26%	-6%
Three Springs	485	524	38	8%	2%
Toodyay	648	564	-85	-13%	-3%
Wagin	496	491	-5	-1%	0%
Walpole	653	569	-84	-13%	-3%
Waroona	373	587	214	57%	9%
Wickham	558	625	67	12%	2%
Williams	578	484	-94	-16%	-3%
Wiluna	269	288	19	7%	1%
Wongan Hills	439	589	150	34%	6%
Wundowie	436	566	130	30%	5%
Wyalkatchem	585	305	-280	-48%	-12%
Wyndham	618	535	-83	-13%	-3%
York	597	622	26	4%	1%

28 Appendix L. Glossary

Term	Definition
ACTEW	The water and wastewater service provider in the ACT
CAPM	Capital Asset Pricing Model
COAG	Council of Australian Governments
CPI	Consumer Price Index
CSO	Community Service Obligation
ESC	Essential Services Commission (Victoria)
ESCOSA	Essential Services Commission of South Australia
GRV	Gross Rental Value
ICRC	Independent Competition and Regulatory Commission (ACT)
IPART	Independent Pricing and Review Tribunal
IWSS	Integrated Water Supply Scheme
LRMC	Long Run Marginal Cost
MRP	Market Risk Premium
OfWAT	Office of Water (England and Wales)
UTP	Uniform Tariff Policy
WACC	Weighted Average Cost of Capital