Western Australia

Economic Regulation Authority

Inquiry on Urban Water and Wastewater Pricing

METHODOLOGY PAPER

15 October 2004

www.era.wa.gov.au

TABLE OF CONTENTS

1 INTRODUCTION

In June 2004, the Treasurer, in accordance with section 32(1) of the *Economic Regulation Act 2003*, asked the Economic Regulation Authority ("the Authority") to undertake an inquiry into the prices for water and wastewater services in urban Western Australia. The purpose of the inquiry is to inform the government's decisions on the level and structure of water prices in the 2006-07 financial year.

In July 2004, the Authority published an Issues Paper setting out the background to the Inquiry and the issues to be considered and inviting public comment.

This Methodology Paper is the result of the Authority's review of the submissions received in response to the Issues Paper, discussions with other water and utility regulators and regulatory experts in Australia, the experience of water and other utility regulators overseas and discussions with WA water service providers.

The purpose of this paper is to describe the methodology that the Authority intends using to arrive at its pricing recommendations. The paper sets out the questions that the Authority seeks to address, the information service providers are asked to provide in their pricing submissions (including the template for how it can be provided), and the methodology that the Authority intends to use in analysing the information from service providers.

2 REVIEW PROCESS

The following timetable summarises the progress of the inquiry to date and the process for the remainder of the inquiry.

- The Issues Paper was published on 22 July 2004 (see the ERA website on www.era.wa.gov.au). The closing date for submissions was 3 September 2004. The thirty submissions received in response to the Issues Paper have been published on the ERA website.

- The Authority appointed technical and economic consultants, following a public tender process, to assist it in reviewing asset values, capital expenditures, operating and maintenance expenditures and cost allocations of the three service providers. The Request for Tender was published on 21 July 2004 and the selected tenderer, The Allen Consulting Group, was appointed on 17 September 2004. The consultant's final report on their findings is due on 24 December 2004.

- This Methodology Paper sets out the information service providers are asked to provide in their submissions on their recommended prices and the methodology that the Authority proposes to use in assessing their submissions. The service providers' submissions are due on 26 November 2004. The service providers will also be given the opportunity to present their submissions to the Authority. Members of the public and stakeholders will be invited to comment on the submissions.

- The Authority's Draft Report will be published by 18 March 2005. The Draft Report will present the initial findings of the inquiry and will invite public submissions.

- Public forums will be held in Perth, Bunbury and Busselton in April 2005 to discuss the Draft Report.

- The Final Report will be published by 12 August 2005.

3 PRICING FRAMEWORK

Following a review of the submissions in response to the Issues Paper and following discussions with water experts from around Australia, the Authority has developed a framework that it will use to arrive at pricing recommendations.

As prices for urban water and wastewater services are not determined in a market reflecting supply and demand for the services, the Authority intends assessing prices proposed by the service providers by consideration of the following two aspects:

- the prices that would be paid "in total" by the customers of water and wastewater services and whether the total revenue of the service providers derived from these prices reflects the reasonable costs incurred by the service providers including, if appropriate, a rate of return on the regulatory value of assets; and

- the structure of prices and whether this structure provides appropriate signals to users of water and wastewater services in respect of the resources used and costs incurred in the provision of the services, in a context of current and future availability of water, environmental considerations, customer needs and social policy objectives.

In regard to the first of these two aspects of a consideration of water prices, the Authority is contemplating a consideration of the total price for services, and the associated revenue to the service providers, in accordance with a "building block" approach to determining a forecast of total revenue for a predetermined period. Prices are then derived that, on the basis of demand forecasts, are expected to deliver this revenue.

The building block approach involves a "bottom-up" determination of total revenue from component costs, as follows.

$$\begin{aligned} \textit{Total Revenue} \quad &= \quad \textit{Rate of Return} \times \textit{Asset Value} \\ &+ \quad \textit{Depreciation of Assets} \\ &+ \quad \textit{Forecast Operating and Maintenance Costs} \end{aligned}$$

The Authority recognises that Aqwest and Busselton Water do not include a rate of return in their pricing and therefore may need to be treated differently from the Water Corporation. For this reason, the discussion below first considers the methodology that will be used to calculate total revenue for the Water Corporation and then considers the methodology that will be applied to Aqwest and Busselton Water.

3.1 Methodology to Calculate Total Revenue for the Water Corporation

The asset value referred to in the formula above is often referred to as the "regulatory asset value". It is this regulatory asset value that has the most significant impact on the average level of prices, as it tends to drive three quarters of a water business' revenue requirement, through the return on and of this asset value.

There is, however, no particular methodology for determining what the regulatory asset value should be when first considering the setting of prices for services that reflect costs.

Economic theory indicates that regulatory asset values should lie between the value of the assets in their 'next best use', which could be very low for assets like water pipelines, and the value that reflects the cost structure of a hypothetical efficient new entrant, which could be very high. An additional guide is that the regulatory asset value should be at least a value that is consistent with each business remaining a financially viable, stand-alone entity that generates sufficient revenue to be able to finance current operations and investment in growth.

One means of determining where within this range the initial regulatory asset value should lie is to consider the level of revenue that would be appropriate for the business, and then back-calculating the asset value given forecasts of operating and maintenance costs, depreciation and a rate of return.

Identifying an appropriate level of revenue requires consideration of, among other things, the level of return on assets, the allowance for depreciation that is necessary to reflect the aging of assets and the efficient level of operating and maintenance expenditure. Of these factors, operating and maintenance costs and depreciation can be determined by consideration of technical factors. The level of return on assets, however, requires consideration in terms of a trade-off between the value of those returns and the prices faced by consumers. A low regulatory asset value multiplied by a rate of return gives a low return on assets, corresponding to a low total revenue and low prices. A high asset value multiplied by the same rate of return gives a high return on assets, corresponding to a high total revenue and high prices. In contemplating a possible regulatory asset value above the minimum required to return the total revenue necessary for the business of the service provider to be sustainable, attention needs to be given to this trade-off.

Given the complexity associated with setting the initial regulatory asset value, it is important that the value is arrived at in a transparent fashion and that any tradeoffs involved are clearly identified.

3.2 Methodology to Calculate Total Revenue for Aqwest and Busselton Water

Calculation of the initial value of the regulatory asset base is more difficult for Aqwest and Busselton Water because they view their customers as their shareholders and as a result do not include a rate of return in their prices. The regulatory asset value estimates that are back-calculated could therefore only be based on forecast depreciation. Given the uncertainty associated with the lives of assets used in the water industry, the values that would be arrived at from such a calculation would be less reliable than estimates that were also based on a level of return.

As Aqwest and Busselton Water do not currently have any competitors, the absence of a rate of return in their pricing does not create any competitive neutrality concerns. However, in the event that they were to provide services in markets that may become competitive, such as in areas just outside of their licence operating areas, the prices in these markets would need to include a rate of return on the value of investment made to service the new markets.

The Authority recognises that estimating regulatory asset values for Aqwest and Busselton Water is not necessary for the purposes of this inquiry. The focus of the analysis for Aqwest and Busselton Water will be on ensuring their average revenue covers their operating and maintenance costs and provides for asset replacement and new investments. Therefore, the Authority is not asking Aqwest or Busselton Water to provide estimates of their regulatory asset values in their pricing submissions.

However, the Authority will be asking its consultant to estimate notional regulatory asset values for Aqwest and Busselton Water based on estimates of regulatory depreciation. Estimated rates of return will be applied to these notional regulatory asset values to calculate the approximate value of "discounts" that customers of Aqwest and Busselton Water are receiving as a result of not having a rate of return included in their prices.

3.3 Pricing Structures

Once the revenue requirements have been estimated, it is then necessary to consider how prices should be set to recover that amount of revenue. Here again, economics provides some guidance: prices would engender the efficient use of water resources if they reflect marginal costs of service provision. Prices based on the marginal costs of service provision potentially provide a means of influencing:

- decisions about the consumption of water, such as the establishment of bores and gardens or the purchase of water-efficient appliances;
- the viability of supply augmentation; and
- service providers' internal decision making such as their incentives to promote water efficiency or leakage control.

Setting prices in accordance with principles of marginal-cost pricing has some support by stakeholders, with for example the Water Corporation indicating that:

> "Water prices should reflect the long-run cost of achieving supply and demand balance." (p40)

and the Department of Treasury and Finance saying:

> "Pricing at the long run marginal cost can help ensure that new sources are only developed in time for when the value consumers put on the additional water source exceed the cost of the water." (p4)

It is important that any reasons for deviating from marginal cost pricing are robust and transparent. This principle needs to be applied to any adjustments to prices to achieve social objectives (such as through providing discounts for the first 150KL of water usage) and to take into account externalities. The objectives need to be clearly defined and the benefits of using water pricing to achieve those objectives need to more than offset the costs.

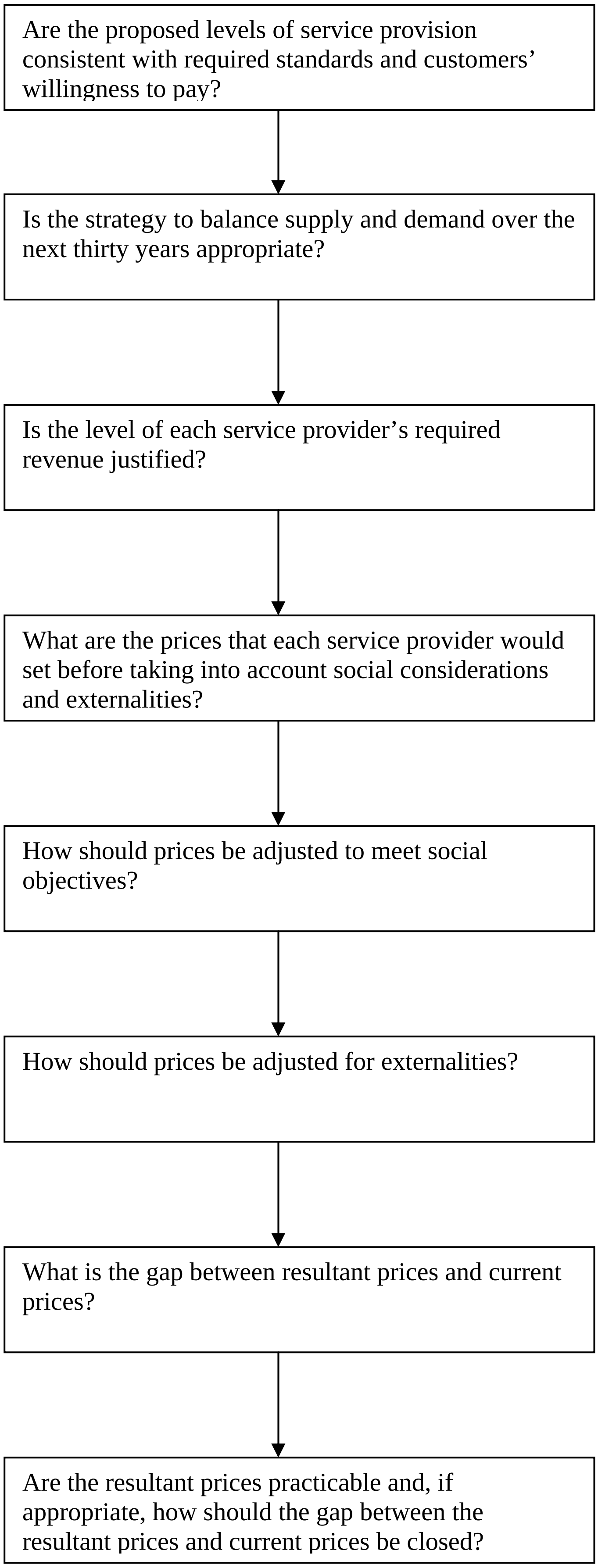
In conclusion, it is important that water and wastewater prices are set in a transparent manner and that the method of arriving at final prices is justified. In considering pricing structures, the Authority will be looking to service providers to provide clear reasoning for the pricing structures that they are proposing.

A template has been developed as a guide for service providers when preparing their pricing submissions. The template is based on the pricing framework that is summarised in Figure 1 on the next page.

- The first step of the framework is to check that the proposed levels of service provision are consistent with the environmental, health and service standards required of each service provider. Where the proposed levels of service are above recognised standards, the Authority will be looking to each service provider to verify that its consumers support the higher levels of service proposed.
- The second step is to check that each service provider has a robust strategy to balance supply and demand for the next thirty years.
- The third step is an assessment of service providers' required revenue.
- For a given level of revenue, the service providers are then asked to determine the pricing structure that they would set before taking into account social considerations or externalities.
- Adjustments to achieve social objectives or to include externalities should then be made following a detailed analysis of the costs and benefits of making the proposed adjustments.
- After all adjustments have been made, the resulting prices and pricing structures should be compared to those currently in place and that consideration be given to the practicability of implementing the resulting prices and pricing structures.

The remainder of this paper provides the template that the Authority expects water service providers to follow when preparing their pricing submissions.

Figure 1 Water Pricing Framework



4 TEMPLATE FOR SERVICE PROVIDERS' PRICING SUBMISSIONS

4.1 Format of Submissions

Water service providers are asked to provide summary information in the body of the submission and provide further information as attachments. The Water Corporation is asked to provide two submissions, one for water and the other for wastewater (as Aqwest and Busselton Water do not provide wastewater services, they would each provide a single submission). Where information provided is of a commercially confidential nature, it should be clearly marked confidential and be provided as separate attachments.

4.2 Service Levels

The question the Authority will be considering is:

> Are the proposed levels of service provision consistent with required standards and customers' expectations?

Service providers are asked to demonstrate that their projected service levels are consistent with the standards required by their regulators and are consistent with their customers' expectations. Where service levels exceed regulatory requirements, service providers are asked to verify that consumers are willing to pay for the higher service levels.

The Authority would also like service providers to advise whether service characteristics that are not regulated, such as aesthetic parameters of water quality, are provided at levels that are consistent with consumers' expectations.

As the Authority is only one of the regulators in the water industry, the Authority will be forwarding the public versions of the submissions to the Department of Health, Department of Environment and Water and Rivers Commission seeking comment.

4.3 Provision for the future

The question the Authority will be considering is:

> Is the strategy to balance supply and demand for the next twenty to thirty years appropriate?

This question is important because it is an input into the consideration of capital, operating and maintenance expenditures, long-run marginal cost and revenue requirements.

4.3.1 Demand

4.3.1.1 Demand projections

Are the demand projections robust?

Service providers are asked to submit for each customer class:

- a description of the drivers of demand and the relative importance of each;
- a description of the methodology used to forecast demand;
- a justification of the underlying assumptions; and
- a description and justification of high/medium/low scenarios for demand.

4.3.1.2 Security of supply

Is the security buffer justified?

Service providers will have incorporated into their demand projections a security margin. The Authority will need to understand the underlying justification for the level of security chosen by the service providers. In particular, service providers are asked to demonstrate that the proposed level of security provides a net social benefit.

4.3.2 Meeting Demand

The Authority will need to understand the costs, benefits and interactions of each of the options considered by the service providers, and the decision-making process used, in arriving at the proposed strategy for balancing supply and demand over the next 20 to 30 years. It may be necessary for a range of scenarios to be presented, so that the Authority is in a position to understand the costs that would be avoided or incurred under different options.

4.3.2.1 Source development

Is the source-development or wastewater-plant timetable justified?

Service providers are asked to explain their selection and timing of source development or wastewater plant options, in terms of the costs and benefits of different options.

4.3.2.2 Demand management

Is an economic level of demand management demonstrated?

Service providers are asked to explain to the Authority how they have incorporated demand management options into their strategies to balance supply and demand. This will include setting out the costs and benefits of demand management options.

4.3.2.3 Leakage and losses

Is an economic level of leakage and losses demonstrated?

Service providers are asked to set out their approaches to the management of leakages and losses, including costs and benefits.

4.4 Revenue Requirements

The question the Authority will be considering is:

Is the level of required revenue for each year justified?

The Authority is asking for information to be provided on the following issues:

4.4.1 Initial Value of Regulatory Asset Base

Is the initial value of the regulatory asset base appropriate?

It is noted that the Water Corporation has proposed a regulatory asset base in its submission in response to the Issues Paper. The Authority will be seeking guidance from its consultant on whether the proposed value is appropriate. For completeness in its pricing submission, the Water Corporation is asked to restate the reasons for the value proposed.

As discussed above, the Authority is not asking Aqwest or Busselton Water to propose initial regulatory asset values.

4.4.2 Capital Expenditure

Is the capital expenditure programme appropriate?

Service providers are asked to describe and justify their capital expenditure programmes for the next five years[1]. This will include demonstration that the significant projects are necessary, the amount of expenditure on these projects is justified and that the timing has been optimised (i.e. the benefits of delaying the expenditure do not exceed the costs).

A detailed explanation is requested by cost driver (e.g. base maintenance, supply and demand balance, quality and standards, enhanced service).

Service providers are asked to identify any capital expenditure that would not be carried out if they were acting in a commercial manner (except for capital expenditure related to meeting licence requirements).

[1] Note that five years was chosen because this is the period that service providers currently use for their forward financial estimates. The Authority will publish its recommendation on the proposed length of the price period in the Draft Report.

4.4.3 Depreciation

Is the level of depreciation appropriate?

Service providers are asked to provide the level of depreciation that they consider is consistent with maintaining the regulatory value of their assets (i.e. to maintain the service potential of their assets). While Aqwest and Busselton Water are not being asked to provide estimates of their regulatory asset values, they nevertheless are setting aside an amount of money each year to fund asset replacement. Aqwest and Busselton Water are asked to explain the method they use to calculate their provisions for asset replacement.

The Authority notes that the Water Corporation generally funds its asset replacement through internal sources and borrowings and uses an accounting approach to ascribe a value to depreciation. The Water Corporation is asked to describe and justify the method of depreciation that it would propose to use in a regulatory determination of prices for water and wastewater services.

4.4.4 Rolling Forward the Regulatory Asset Base

Is the value of the regulatory asset base for each of the next five years appropriate?

The Water Corporation is asked to provide estimates of the value of its regulatory asset base for each of the next five years. Consistent with standard regulatory practice, the opening regulatory asset value will be updated each year by adding capital expenditure over the previous year (net of customer contributions and disposals) and subtracting an allowance for depreciation.

As discussed above, the Authority is not asking Aqwest or Busselton Water to provide estimates of their regulatory asset values.

4.4.5 Rate of Return

Is the requested rate of return appropriate?

It is noted that the Water Corporation has proposed a rate of return in its submission in response to the Issues Paper. The Authority will be considering whether the proposed value is reasonable. For completeness in its pricing submission, the Authority asks the Water Corporation to restate its rate of return in this submission (including the assumptions underlying this figure).

While Aqwest and Busselton Water do not make dividend payments to shareholders nor finance new investment by debt, the Authority will be giving consideration to the likely cost of capital to these businesses in terms of the opportunity cost of capital that may be invested in system expansions. Aqwest and Busselton Water are invited to, but are not asked to, provide estimates of a cost of capital that may be relevant to their businesses.

4.4.6 Operating and Maintenance Expenditure

> To what extent is operating and maintenance expenditure at an efficient level and what scope is there for efficiency gains over the next five years?

Service providers are asked to explain and justify their operating and maintenance expenditure proposals for the next five years (with maintenance expenditure clearly differentiated from operating expenditure). This will include explaining any expected efficiency gains in annual operating and maintenance expenditures.

A detailed description is requested of the drivers of operating and maintenance expenditure and any specific initiatives for reducing such expenditures.

Service providers are asked to report on any costs that appear to be outliers in relation to industry best practice and explain why the costs are outliers.

Service providers are asked to identify any operating and maintenance expenditure that they would not carry out if they were acting in a more commercial manner (except for operating expenditure related to meeting licence standards and conditions, i.e. not related to providing services to regulated areas below cost).

4.4.7 Revenue Requirement

> What are the implications of the above decisions on the amount of required revenue for each of the next five years?

Service providers are asked to propose a total revenue requirement and the components of this revenue requirement for each of the next five years.

Service providers are asked to identify the portion of the revenue required to carry out functions that are not consistent with its purpose of acting in a commercial manner and in a way that is consistent with the standards and conditions in their licences.

4.4.8 Commercial Viability

> What level of financial performance is implied by the requested level of required revenue?

Service providers are asked to provide information (e.g. financial indicators) that demonstrates the level of financial performance that is expected over the next five years and explain why they consider this level of financial performance is appropriate.

An analysis of financial performance is important because it indicates whether a service provider will generate sufficient revenue to remain a commercially sustainable, stand alone entity.

This information can also be used as a 'check' on the proposed initial value of the regulatory asset base. For example, if a service provider's initial regulatory asset value provides a level of financial performance that is high in comparison to its peers, this could indicate that the initial regulatory asset value and associated revenue requirement are too high.

As the focus of an assessment of commercial sustainability is the ability of an entity to meet its cash obligations, the most relevant financial indicators are those that are based on cash measures rather than on accounting entities. The cash-based financial indicators that both regulators and ratings agencies most commonly use for assessing the strength of cash flows (for organisations with debt such as the Water Corporation) include:

- Funds Flow Interest Cover, which measures the level of protection the entity has to meet its interest obligations after meeting its cash operating expenses (including taxation payments). The formula is as follows:

  (FFO + Net Interest) / Net Interest

  where FFO is 'funds from operations' (or 'funds flow from operations'). Funds from operations is approximately equal to the accounting definition of net cash flow from operating activities, less the sources of non recurrent revenue – that is, revenue from customer capital contributions, and the proceeds of disposals removed.

- Debt Payback Period, which measures the length of time that the entity could retire its debt if it devoted all cash flow (after meeting cash operating expenses) to this purpose. While the entity would never be expected to pursue this course of action, the indicator shows the scope to change the debt level if the need arose. It also provides a reasonable cash-based measure of the overall indebtedness of the entity. The formula is as follows:

  Net Debt / FFO

- Gearing measured as a proportion of the regulatory asset value. Ratings agencies increasingly use gearing based upon debt as a proportion of the regulatory value of the assets for regulated entities, given the strong relationship between the regulatory value of a regulated asset and its cash flows.

An indicator that is not dependent on debt and therefore of relevance to Aqwest and Busselton Water as well as the Water Corporation is:

- Internal Financing Ratio, which measures the proportion of new capital expenditure the entity is expected to be able to finance from retained cash flow after meeting cash operating expenses (including taxation and interest payments) and paying the expected dividend (in the case of the Water Corporation). The remainder of capital expenditure is expected to be financed through debt. The formula is as follows:

  (FFO – Dividends) / Net Capital Expenditure

4.5 Identifying Base Prices

The question the Authority will be considering is:

> Are the prices that each service provider would set before taking into account social considerations and externalities appropriate?

The question here is how service providers would set prices without demand restrictions or other social policy considerations or the need to include externalities (these matters are taken into account in the next section).

Service providers are asked to propose whatever approach they consider appropriate for identifying base prices and explain the approach used.

Service providers are asked to demonstrate that the proposed base prices reconcile with the revenue requirement identified above.

The proposed base prices may differ by customer group. The service providers are asked to provide justification for the allocation of costs/revenue across different customer groups.

In its analysis, the Authority will be interested in comparing the proposed base prices in each case with estimates of short-run and long-run marginal costs.

- The short-run marginal cost represents the price that would balance supply and demand without resorting to investment in additional capacity.
- The long-run marginal cost is based on the costs of bringing forward the current supply augmentation programme.

Consultants appointed by the Authority will be working with the service providers to obtain estimates of short-run and long-run marginal costs.

4.6 Adjusting Base Prices

4.6.1 Meeting Social Objectives

The question the Authority will be considering is:

> How should the base prices be adjusted to take into account social considerations?

Currently, the following 'adjustments' are made to prices to achieve various social objectives:

- using demand restrictions rather than price increases to engender a demand response to shortages in water supply;
- discounting the price for the first 150KL of water usage;
- discounting the price for pensioners and seniors;
- setting tariffs that increase in steps; and

- setting water usage tariffs up to 350KL of annual water consumption at the same level for residential customers throughout the State.

Service providers are asked to:

- explain the reasoning and circumstances that led to each of the adjustments (including an explanation of the social objective that underlies each adjustment);
- explain whether other pricing adjustments or non-pricing methods would more effectively and efficiently achieve the social objectives that are identified; and
- recommend price adjustments that are consistent with the social objectives identified.

The setting of prices to meet social objectives may compromise the ability of the service providers to recover the total revenue determined to be reflective of costs incurred in service delivery. Where this is the case, the service providers may consider whether they should be compensated for the difference through a community service obligation (CSO) payment.

Service providers would be aware that the State's CSO policy has two aspects: a directive or request by government; and the carrying out of "activities relating to outputs or inputs which it would not elect to do on a commercial basis".

Service providers are asked to provide to the Authority details of any potential claim for CSO payments from the State Government. In doing so, service providers are asked to provide their CSO claims based on making the pricing adjustments in this section, and also based on the portion of their revenue requirement that would be funded by CSOs (as identified in section 4.4.7).

Service providers are asked to provide forecasts of the extent that they predict they can make annual efficiency gains over the forecast period, and consequently reduce their claimed CSOs. An explicit efficiency factor is requested to be provided along with an explanation of why that figure was chosen.

In some instances, such as the imposition of demand restrictions, it will be a matter for government to decide whether it wishes to pay for the social objective by making CSO payments or by accepting lower dividends. The service providers are asked to identify the amount of CSO payments and/or lower dividends underlying their assumption.

4.6.2 Adjusting for Externalities

The question the Authority will be considering is:

How should prices be adjusted to take into account externalities?

Prices may also be adjusted for the costs of externalities, such as environmental costs. In its response to the Issues Paper, the Water and Rivers Commission proposed the introduction of a $15 million per annum charge for water resource management, which would cover the efficient costs of managing and protecting water supplies to ensure their long term sustainability.

Service providers are asked to demonstrate how they would change their prices if they were asked to contribute to the cost of water resources management.

Service providers are also requested to identify the externalities that are currently being internalised and demonstrate what other adjustments to prices could be made to take into account externalities.

4.7 Comparison with Current Prices

The question the Authority will be considering is:

> Should the gap between the resultant prices and current prices be closed?

The Authority is requesting each service provider to consider the 'gap' between their 'resultant prices' and the current prices. This gap may relate to the total price for water services (and the corresponding revenue to the service provider) or to the structure of prices.

In doing so, it is requested that service providers:

- identify implementation costs, impacts on customer groups and impacts on government expenditure and dividends; and
- propose transitional arrangements for moving from current prices to resultant prices.

4.8 Price Recommendations

Service providers are asked to clearly summarise their final price recommendations.