AQWEST Submission to the ERA Inquiry on Urban Water and Wastewater Pricing Draft Report

This submission provides a brief response by AQWEST to issues raised in the Economic Regulation Authority's (ERA's) Draft Report of the Inquiry on Urban Water and Wastewater Pricing (ERA, 2005). Due to the short timeframe provided by the ERA, comments are brief, and directed particularly at issues in the report and supporting documentation, which are of greatest concern to AQWEST. AQWEST is happy to provide further clarification on specific points raised in this document upon request. This submission is divided into two main components:

- Issues associated with the draft report proper.
- Issues associated with the supporting documentation and modelling results provided by the ERA's consultants.

There are also some issues pertaining to the inquiry process as a whole. These are detailed below, prior to the main body of the submission. They are:

- **Insufficient time for response:** The ERA provided itself with three months to review and assess AQWEST's submission to this inquiry and compile a draft report, but provides only a month for responses. Moreover, given the intrusions of the Easter break, the need to meet with the ERA to seek further clarity on some points of the review and the requirement for AQWEST to present its submission to its Board, the effective time which could be devoted to preparing this response is less than one week. It is for this reason that it is brief.
- **Misleading and insensitive language:** The ERA's draft report contains numerous poorly considered statements (detailed further below) pertaining to AQWEST's business which substantially misrepresent both the realities of this business and the results of the ERA's own modelling, which is poorly explained in the document. The report is a public document, and AQWEST must defend the assertions the report makes in the public arena, a task which is substantially increased by the use of careless language on the part of the ERA, and by the ERA not explaining the assumptions underpinning its conclusions (particularly in regards to its modelling) in a way which is clear to a lay reader. It is hoped that the final report will address this issue. For example, the statement (on page 6 and elsewhere through the document) that *"Both of these businesses (*AQWEST and Busselton Water*) are, however, generating revenues in excess of levels necessary to maintain the business and finance capital expenditures..."* is made without any basis in fact or as the result of any investigation of facts. The basis of this statement is the set of assumptions which have underpinned the ERA's modelling of regulatory asset values and not, as it may easily be interpreted by a lay reader or one of AQWEST's customers, on the basis of AQWEST's actual operations, which benchmark well against its peers. Not only do statements like this bring no credit to the ERA, but they also denigrate a group of hardworking and committed community members on AQWEST's (and Busselton Water's) Board, who have laboured, largely unpaid, over a long period of time to ensure the long-term sustainability of this essential service. Moreover, it violates one of the key considerations stated by the ERA as being a basis of this inquiry (p19) that it would take into account the 'legitimate business interests' of the water utilities being reviewed.

- **Lack of industry knowledge:** Apart from statements concerning AQWEST's business, the report also makes a number of unsubstantiated statements about the water industry as a whole, which run counter to AQWEST's own hundred year experience in the industry. If these statements (on issues as critical as the economics of water demand and the cost structures of water companies) are to form the basis of rational policy in the industry, they need to be based on firm research, and this research should also be made available in the public arena by the ERA. The errors in the calculation of long run marginal cost and the unsubstantiated comments on customer willingness to pay and demand elasticity are but three examples of this.
- **Lack of consideration of points in AQWEST's submission:** In November and early December of 2004, AQWEST spent substantial internal resources and approximately $25,000 of fees on external consultants to present a submission to the ERA. However, many points raised in that submission appear to have been ignored. For example, in the ERA's consultant's report on financial modelling, cost apportionment figures (amongst consumer classes) are based only on 2003/04 data, even though the AQWEST submission provides projections forward to 2008/09.[1] Discussions with the ERA indicate that the projections were not included because that part of the consultant's report was written prior to their receipt. It is disappointing that the ERA has not been able to incorporate them in the three months following their submission, particularly as they have a considerable bearing on the consultant's findings. For this reason, AQWEST's original submission is provided, once again, as an appendix to this document, in the hope that it will be considered for the final report.
- **Recommendations:** The ERA at a recent meeting stated that it makes no recommendations with regard to pricing of AQWEST's water. Whilst this is true, the language of the report makes it quite clear that the ERA has come to some firm conclusions concerning the nature of AQWEST's business, and it appears these conclusions have been made at the outset of the inquiry, as the report makes few comments on AQWEST's views on the various issues and the ERA's own views do not appear to have changed through the course of the inquiry, regardless of the evidence AQWEST attempts to put to it.
- **Lack of focus on pricing:** One of the key rationales for undertaking this inquiry was to determine whether the prices charged by the various agencies were appropriate. However, in the case of AQWEST, no mention is made concerning the appropriateness of its prices and the ERA does not even mention what AQWEST's prices are, let alone assess them. In fact, the models of the consultants begin from the assumption that the revenue streams of AQWEST (and hence its prices) are correct, and then works from these to determine an asset base. It is not clear what conclusions the ERA has come to in regards to AQWEST's prices. AQWEST has endeavoured to rectify this omission in this submission by recasting the ERA's findings, such as they are, in terms of prices.
- **Preserve Current Revenue Assumption:** Related to a lack of focus on pricing is the assumption by the ERA (which underpins the consultants' modelling of asset values) that the current revenue streams of AQWEST are appropriate. Despite the efficiency of revenues being a clearly stated aim of the inquiry, these have not been assessed for AQWEST. The inquiry does not address the issue of under or over capitalisation or operational resourcing which would cause over/under

[1] Moreover, these projections reverse the findings of this chapter of the consultant's report.

pricing. It is considered the inquiry should investigate appropriate levels of capital investments and operational costs to determine if the utilities are operating at optimal levels. AQWEST regularly benchmarks itself against the Victorian Water Association utilities and details are included in its previous submission (see appendices). Some form of investigation of National and International comparisons would have been of far greater value than the ERA concentration of calculating notional regulatory asset values. In fact, of the eight steps of the inquiry detailed on pages 19-21 of the Draft Report, for AQWEST, the ERA has taken only the first two, meaning that three quarters of the work remains to be done. AQWEST eagerly awaits the completion of the remainder of this work, so it can understand the basis by which it is to be regulated in the future.

Detailed below are AQWEST's responses to specific issues in the Draft Report, and accompanying consultant's report.

Issues Associated with the Draft Report

This section outlines some issues associated with the Draft Report. AQWEST has limited its comments to the sections of the report which pertain to it and has thus not addressed the chapters devoted to the Water Corporation or Busselton Water.

Page two begins a discussion on long run marginal costs (LRMC), efficient prices and their use in signalling scarcity. The ERA has made no comments on AQWEST's pricing, but it has made substantial commentary elsewhere in the report about the use of LRMC pricing, which suggests that, when AQWEST's legislative environment is clarified and the ERA makes recommendations on price, LRMC (or at least the ERA's proxy of this) will form a basis for pricing. This is of concern to AQWEST, for the ERA's analysis has a flaw in its logic; prices based on LRMC are workable only if the LRMC is constant or the regulated utility can produce at the output level corresponding to the point on the LRMC intersected by the price cap. If LRMC is declining over output (which is the case for a natural monopoly) and the current levels of market demand fall far short of the levels required to optimise, or the utility is unable to service the increase in demand necessary, then setting a price cap at LRMC may well bankrupt the utility. This is discussed further later in this submission, and is a key issue which does not seem to have been considered by the ERA.

Page two also makes reference to the close substitution between urban and irrigation water, with no real indication of how this curious and unsubstantiated claim was derived. It is considered highly unlikely that irrigation water prices are 'clearly relevant for setting urban water prices' (p2). Potable urban water and non-potable irrigation water are not close substitutes. The two uses may compete at the margin for overall water supplies but, given the fact that the Water and Rivers Commission (WRC) allocates water licences rather than forcing parties to bid for it, the conjecture seems strained at best.

The same discussion makes comments about consumer willingness to pay, and the ERA later makes comments in regards to this issue in its chapter on AQWEST. However, it does not appear that the ERA has undertaken any research pertaining to consumer willingness to pay, nor that the ERA has utilised any such research undertaken by other organisations to inform its views on precisely what consumers in WA are willing to pay for their water in Western Australia. Given that the inquiry is

supposed to be about appropriate prices and service quality levels, this omission is puzzling. In a similar vein, the contention that customers may be "willing to trade-off supply availability and reliability for lower water prices" is completely unsubstantiated. In the recent public debates on the proposal to develop a canal from the Kimberley to Perth, approximately a quarter of those polled in some opinion polls were willing to support the proposal at any cost, and almost half those polled supported the idea within the costs publicised. This suggests that, rather than people being willing to pay lower prices for poorer quality service, they are actually willing to pay higher prices to obtain better quality service. AQWEST's customer surveys suggest the same thing. This has not been addressed at all by the ERA, and it is suggested that the focus on lower prices and poorer service is both incorrect and out of step with actual customer expectations.[2] AQWEST would welcome some research by the ERA in its final report which clarifies and substantiates its position on willingness to pay, or at least recognition that lower prices and poorer service are not the only likely outcome.

The ERA has devoted some time to the discussion of incorporating environmental externalities and social goals into water pricing, on page two and elsewhere in the document. This is curious, as the degree to which it is the role of regulated firms to address these issues, or of an economic regulator to regulate them is questionable. AQWEST has addressed these issues in its previous submission. It is not clear whether the ERA has considered these views, as its commentary on both of these issues closely mirrors the original methodology paper. In regards to externalities, the suggestion (p163) that a fixed charge is optimal contradicts both the economic theory and empirical evidence associated with externalities (and is unsubstantiated). The whole point in regards to externalities is that they are not incorporated into the prices charged to consumers and consumers, not being exposed to these real resource costs, do not reduce their consumption to the optimal level. Externalities are addressed by government re-establishing the link between consumption by final consumers and the real resource costs of this consumption. Levying a fixed fee on the water utilities will completely fail to send a signal to final consumers concerning the impact their consumption has on environmental flows of water. Whilst the science of costing the value of such environmental flows is still in its infancy, as the ERA notes,[3] AQWEST maintains its position that, rather than starting off in a poor direction in regards to environmental concerns, it would be much better for the agencies involved in resource management (the Water and Rivers Commission, *not* the ERA) to establish a per unit resource cost for water, which AQWEST would pay, and then pass on to its customers in full, to ensure that appropriate signals are passed to consumers.

In terms of social objectives, the ERA notes, (p163) that it is indifferent as to whether these are publicly funded via direct payments or funded through reductions in dividend payments. It should not be so blasé, particularly given that economic

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[2] It also ignores the public health issue, which is the prime reason why potable water supplies were developed in Nineteenth Century Britain in the first instance; to prevent the spread of cholera. The public health risks associated with lowering water quality standards is a substantial issue, not even addressed by the ERA, and the only comment on public health in regards to AQWEST is a note that AQWEST will have to face higher standards in the future.

[3] Although, as the evidence in the Western United States shows, the development of trading regimes allows for concerned citizens or the state to bid for environmental flows, and hence both establish prices and conserve water for the environment.

analysis suggests that the optimal way in which to fund social objectives (like cheaper water for pensioners, for example) is via transfers direct to customers, and that payments to providers are a second-best option. Also, the suggestion that the Water Corporation should provide justification for its CSO payments to government reverses the appropriate direction of dialogue; government, not corporatised utilities (and not the ERA), is responsible for the formulation of social objectives and the costing and disbursement of appropriate funds. It is apparent that substantial work remains to be done on the appropriate manner in which environmental and social objectives pertaining to the water industry in WA are addressed. However, it is unclear why the ERA should be the driving force behind such work.

The suggestion on page three (and later on pages 124 and 133) that AQWEST and Busselton Water sell part of their allocation to the Water Corporation is, in principal, a useful policy direction. However, the infrastructure to transport the water would need to be written off rapidly enough to reflect the fact that the allocations are only temporary. If the transmission pipelines are very short, this might be possible, but it seems highly unlikely for longer pipelines. AQWEST looks forward to analysis by the ERA supporting the viability of this policy option in its final report.

The suggestion on the same page that AQWEST and Busselton Water face lower LRMC than the Water Corporation may be true for some of the Water Corporation's operations. However, comparing like with like, it is simply untrue. The Water Corporation provides water services in Eaton-Australind and in Dalyellup, on the borders of AQWEST's operations, using the same aquifer and similar production techniques, and yet it both charges 20 percent more than AQWEST and it is understood that it receives a 12 percent CSO from government to do so in Eaton-Australind. Given that CSOs are payable where the cost of service cannot be met for the prices required by government policy, this means that, where the Water Corporation faces the same type of operation as AQWEST, its costs are some 20-30 percent higher than AQWEST's. It may well be true that the Water Corporation faces higher LRMC than AQWEST for its operations as a whole, but, as the cases of Eaton-Australind and Dalyellup show, it is not clear that this is because AQWEST has a more abundant supply of water than the Water Corporation and does not face its supply-demand imbalance problems.

The discussion on page four concerning elasticity of demand and suggesting that price is not useful as a tactical instrument to manage demand is simply incorrect. AQWEST has a history of using price very effectively as a tactical means of controlling demand, detailed in its submission. The ERA has ignored this empirical evidence. Whilst the short run elasticity of demand is low, as many studies have found, very little academic study of the long run elasticity of demand (particularly in the WA context) has been done. However, AQWEST's experience is that, in the long term, the elasticity of demand for discretionary use of water is quite high; people do, for example, plant less water intensive plants in their gardens in response to higher water prices. AQWEST would be happy for its data to be utilised in a formal study of the long run elasticity of demand for water in WA, such that this could better inform public policy in this area. In fact, it considers this to be a key issue, as it reverses the ERA's somewhat unsubstantiated findings on the need to reduce the number of tariff steps, and to establish penalty rates only at very high levels of demand.

On page five (and later, in Chapter Seven), the ERA suggests that the tariff basket approach is not appropriate, as it does not allow the ERA to ensure that each and every price reflects LRMC. This seems to be a poor direction for water policy in WA to be taking. Quite apart from the fact (see the section on LRMC) that pricing at LRMC in the manner suggested by the ERA is fundamentally flawed for utilities facing downward sloping LRMC curves and demand constraints, the fact that many other regulators have adopted a tariff basket approach for regulation, not only of water but of other utilities, does not seem to have been considered in any detail by the ERA. If the ERA is to begin establishing prices for each and every service operated by AQWEST and other water service providers, AQWEST contends that this will be a very heavy-handed approach, and quite incompatible with any form of incentive based regulation and the 'light-handed' approach which the ERA itself suggests is the best way of regulating prices. The rationale for this is allowing government to achieve its social and economic objectives on water pricing but these are not clearly enunciated, so it is not possible to accurately assess whether the heavy-handed approach proposed by the ERA is outweighed by the benefits of this approach from the perspective of achieving government objectives, and nor is it made clear whether any other, less intrusive methods are also possible. Moreover, as AQWEST has argued elsewhere, it is not even clear that social and environmental goals should be within the ambit of determination by an economic regulator, as they would appear better addressed by the resource manager (in respect to environmental goals) and government (in respect to social goals). AQWEST suggests that, as discussed further in the section on the regulatory asset base, the regulator simply set a price cap for the weighted average of services provided by AQWEST, and allow this to change via a CPI-X mechanism, with minimal oversight. An appropriate means of undertaking such regulation has been proposed to the ERA in its rail infrastructure regulation (see Bloch, Kenyon & Wills-Johnson, 2004) and is being considered more widely by regulators around Australia. For the ERA to attempt to establish prices for each and every service of AQWEST would reverse the current trends in regulation around Australia, and it is not clear why the ERA has decided to take this retrograde step in regards to water industry regulation.

Page 6 contains a number of comments about AQWEST's business which are not only incorrect or misleading, but also inflammatory. These are repeated elsewhere in the document. For example:
*"Both of these businesses (*AQWEST and Busselton Water*) are, however, generating revenues in excess of levels necessary to maintain the business and finance capital expenditures..."*
"With their current financial structure and absence of obligations to make dividend payments, the initial regulatory asset values for both AQWEST and Busselton Water could be set at zero in 2003/04 (with a concomitant reduction in customer charges of 21 percent and seven percent respectively, in 2006/07). This can be achieved without compromising the viability of the business and without requiring the business to take on debt"
Whilst it maybe true that, within the narrow confines of the economic modelling undertaken by the ERA's consultants, such manipulation may be possible and have no effect on the model's outcomes, to a lay reader (and more particularly, to one of AQWEST's customers reading the Draft Report), what statements like those above suggest is that AQWEST is basically fleecing its customers. AQWEST understands that this not what the ERA means. However, the Draft Report contains no details of

the modelling undertaken, no explanation of the various assumptions used and no explanation of what the results imply in the real world of the prices faced by AQWEST's customers. Moreover, the supporting documents which contain this information have been removed from the ERA's website. The second statement in particular, defies sensible interpretation. AQWEST's prices are some 20 percent lower than those charged by the Water Corporation on AQWEST's boundary (at Eaton-Australind and Dalyellup) with a 12 percent CSO (in AQWEST's understanding) payable at Eaton-Australind. Is the ERA seriously suggesting that AQWEST's correct and sustainable price is half that charged by the Water Corporation, in markets where source access costs are the same and similar production technology is used? If this is the ERA's recommendation, why does it not also recommend that AQWEST take on the water supplies at Dalyellup and Eaton-Australind, to pass on these cost savings to consumers in these areas?

AQWEST has attempted to address the issue of misleading and inflammatory statements in its discussion of the regulatory asset base below, by recasting the notional regulatory asset bases calculated in terms of price caps.[4] AQWEST urges, in the strongest possible terms, that the ERA take some cognizance of the fact the draft and final reports are not the repositories of idle economic musings, but public documents which will actually be read by members of the public, who will then demand from AQWEST some explanation as to why the regulator seems to be implying that it is charging too much. The use of such careless language and the lack of any type of explanation of where the relevant numbers have come from in the Draft Report is of serious concern and AQWEST expects substantial improvements in the way in which information in the final report is presented for public consumption. Page 13 of the report notes that the ERA has conducted its inquiry cognizant of Section 26 of the *Economic Regulatory Authority Act 2003*, which requires it to (among other things) to have regard to "the legitimate business interests of investors and service providers in relevant markets". Through the use of misleading, poorly-explained comments such as those cited above, AQWEST contends that the ERA comes close to contravening is own governing act, in spirit, if not in legal fact.

Also on page seven, the ERA suggests that prices could be affected by a requirement that AQWEST make payments of dividends to the State Government. At least the inquiry acknowledges the possibility that AQWEST's legislation is mooted for change. If the inquiry is to make recommendations on dividend policy, it should also state that AQWEST's ability to act commercially, compete and participate in a reformed water industry is totally restricted by its legislation and that changes to the legislation should be a matter of urgency for the Government. However, the inquiry is supposed to be about determining appropriate prices for water in Western Australia, not about the institutional arrangements between AQWEST and the State Government. Moreover, there has been no decision in regards to dividend payments and (as clearly outlined in its previous submission), AQWEST considers there to be no case for the State Government, which has not contributed any equity to AQWEST over its 100 year history, to be in a position to demand dividend payments from it; AQWEST's shareholders are the people of Bunbury, who have contributed equity to

[4] When this is done, the ERA's assertion about 21 percent price reductions is simply incorrect, the actual price cap in 2006/07 is exactly the same as AQWEST's calculation of LRMC for all users in that year. It is not clear whether the ERA fully understands the consequences of the modelling it has commissioned.

the organisation for 100 years. A discussion about dividends, which is not within the scope of this inquiry, particularly one which is so carelessly worded and takes no cognizance of AQWEST's arguments in this regard (beyond a recognition that such arguments have been made, on page 130) is inflammatory, and pre-empts discussions on dividends. It is suggested that, in the final report, if comments are to be made on dividends, then AQWEST's case be reflected in the document and hence provide some balance to the ERA's own glib assertions in this regard.

The discussion on block tariffs on pages 7, 8 and 9, seems driven by a desire to ensure that each and every consumer faces his or her LRMC of supply (despite the flaws in this approach, outlined later in this submission) and as such, contravenes the recent State Government policies on using water pricing for demand management (see AQWEST's previous submission in appendices for details) to say nothing of the experience of both AQWEST and others in this regard. AQWEST has detailed its own experience in the use of inclining tariffs to manage demand in its previous submission. This has been ignored by the ERA, except to point out, with no assessment, (p123) that AQWEST believes it has been successful in this regard. As mentioned, AQWEST would be happy to provide its data on inclined tariffs and demand responses for a serious academic study of this topic. Dinar (2000) provides detailed assessments of both the successes and failures of the use of inclining block tariffs, which are widely employed internationally to manage demand, and would assist greatly in informing the debate on this issue in the Inquiry.

Apart from being a successful means of managing demand, AQWEST's experience of stepped tariffs in Bunbury suggest that, contrary to the ERA's postulations in this regard, they do not confuse customers, and they have not generated a single complaint, in 20 years, on the basis that they are somehow disadvantageous to sections of the community. The statement on page 9 that
"one potential concern about the two-block tariff option is that customers in the upper block are charged above LRMC, which could encourage some households to over-invest in water saving alternatives"
is perplexing, as current Government policy, underscored by rebates for the purchase of water-saving devices, reflects a very strong desire for customers to make precisely these types of investments. Quite why the ERA takes a line opposed to government on this issue is not clearly explained.

Apart from the ERA's LRMC crusade, the only rationale given for its suggestion to reduce the number of steps to two, and to set the cut-off point between the two at 600kL per annum is the effect on large families of six or more people.[5] According to the ABS (2002a), there are 275 households with six or more people in Bunbury out of a total of almost 11,000 households (and households of six or more people make up only three percent of the total in WA as a whole, ABS, 2002b). Although the ERA has ignored AQWEST's evidence in its previous submission in this regard, the use of stepped tariffs as a demand management tool has allowed it to defer roughly $9 million in capital expenditure over the past decade (see previous submission for

[5] On page seven, the ERA states that "one of the drawbacks of inclining tariffs is that, depending upon where the step is positioned, they can penalise large families...". However, apart from the ERA's need to price everything at LRMC, the large families argument is the only drawback it mentions in regards to inclined tariffs. AQWEST looks forward to more detailed consideration of this issue, including consideration of the evidence it has presented, in the final report.

details), resulting in water prices for all of its customers which are some 10-15 percent lower than what they would have been were such deferment not possible. The suggestion by the ERA that AQWEST reverse this successful policy for the sake of 275 households, none of whom have complained about the inequitable treatment the ERA mentions, seems strained at best. AQWEST suggests that the best option for the ERA in terms of tariffs is for it to set a single tariff, for a basket of goods, and then allow service providers experienced in local markets to make adaptations to manage demand in a manner best suited for those markets. If small-scale social concerns arise, these can be dealt with through other means, such as CSOs.

AQWEST is not a wastewater service provider. However, the discussion on page 10 and on pages 107-9 on wastewater seems to avoid the issue of appropriate wastewater charges entirely, which is perplexing, as wastewater pricing is a serious issue in WA, and the status quo is not acceptable, particularly given that WA has the highest charges in Australia, and still relies upon property value based charges, which have been abandoned elsewhere. If, subsequent to future legislative change, AQWEST is able to provide wastewater services, it hopes that a more sophisticated recognition of wastewater charging mechanisms is developed by the ERA, and detailed in its final report. For example, whilst it is difficult to meter wastewater in the same way as water is metered, it is possible to develop models which establish a relationship between water going into a household and the various uses of water in that household, and thus to determine an amount of wastewater produced. Industrial and commercial users of wastewater services (including AQWEST itself) are already billed in this manner. This may well form a more appropriate base for further consideration of appropriate pricing mechanisms.

On page 12, the ERA states that:
"The purpose of the Inquiry is to inform the Government on the level and structure of water prices prior to its consideration of these matters in the 2006/07 financial year. The Treasurer has indicated that this Inquiry will ensure 'accountability and transparency' in the way water prices are set"
If this is the case, why has the ERA made no comments on AQWEST's prices? Not only are its prices not assessed in the Draft Report, they are not even mentioned. Although AQWEST's previous submission contained substantial detail on AQWEST's prices, if the Treasurer is to rely upon the Draft Report to assist him in determining 'accountability and transparency' in AQWEST's prices, he will find it of no assistance. The irrelevant tangent that the ERA has taken into developing a model to ascertain a regulatory asset base for AQWEST has distracted it from the main purpose of the Inquiry. AQWEST has endeavoured, in this submission, to bring the focus back onto prices, and the appropriateness and transparency thereof, and hopes that the ERA will do the same by the time of its Final Report.

On page 18, the ERA makes reference to examining how standards and operating conditions impact on required revenue requirements of each service provider, yet this does not seem to have been addressed in any meaningful way by the ERA in reference to its assessment of AQWEST. Further, on page 20, there is a reference to assessing tariff structures with reference to best practice. AQWEST regularly benchmarks itself against its peers in Victoria and provided such information in its submission. However, there is nothing in the ERA's assessment of AQWEST which involves any benchmarking, except for one graph on page 126 dealing with AQWEST's operating

and maintenance expenditure. This is despite substantial information being in the public domain. In a similar vein, as discussed subsequently, the 'best practice' model of a water utility used by the ERA's consultants does not appear to have been derived from any assessment of AQWEST's peers. Given the importance of benchmarking competition in regulation, this omission seems curious, to say the least.

The statement on page 124 that demand management strategies are 'inefficient' from the local perspective, unless water saved can be sent elsewhere, apart from being inflammatory, is simply wrong. Any water saved now in Bunbury can be used either in the future or by the remainder of the ecosystem. To the extent, in the former case, that future uses are sufficiently more valuable than present uses or, in the latter case, that environmental uses have a greater social value than the displaced urban uses, there is no inefficiency in saving water. Also, one of the key reasons, recognised by water utilities internationally,[6] for engaging in demand management strategies, is to defer capital expenditure, which can result in substantial savings for a water utility and its customers. AQWEST detailed its experiences in this regard in its previous submission, but this seems to have been ignored by the ERA.

On page 126, the ERA notes that it has chosen a target of operational expenditures of $550 per ML, slightly below AQWEST's current costs, but in line with 'general predictions'. However, no supporting evidence is given as to why this level of costs is considered efficient, nor is a source provided for the 'general predictions'. This omission is difficult to countenance when, on the same page, the ERA reproduces a graph from AQWEST's submission showing it outperforming the average of its peers.

On page 127 (and indeed in the consultants' report), the ERA concludes that it will remove capital contributions paid for by developers from AQWEST's capital expenditure, as AQWEST does not fund this capital itself. It is not clear why these have been excluded, particularly given that government is quite happy to tax AQWEST on developer contributions as though they were income. In any case, developers are just one of AQWEST's customer types, and it is not clear why they should be treated differently. Other customers, such as residents and businesses pay for a portion of the capital employed by AQWEST in servicing their needs (that portion not funded by developers) through fixed charges. Would the ERA thus argue that AQWEST is not funding this capital either? The artificial distinction between developers and other customers is poorly justified by the ERA.

On page 128, the ERA notes that only one third of AQWEST's assets have less than 20 percent of their economic life remaining, and concludes thus that "the risk of unidentified high value capital expenditure related to asset replacement in the period 2008/09 is therefore considered to be low". However, in making this assessment, the ERA has ignored *which* third of AQWEST's assets fall into this category. In fact, some of the assets in this category are the mains which run through the centre of the Bunbury CBD, which were built 100 years ago and may require replacement in the next few years. Planning for this, the first time it has occurred, has been occurring for a number of years, but AQWEST considers the risks associated with this major exercise to be anything but small. It is not clear why the ERA has missed this key

[6] Including OfWat in the UK, see OfWat , 2001, p38.

point, as AQWEST's previous submission stated quite clearly that it was about to embark on this asset replacement programme.

Page 131 repeats the earlier contention that AQWEST earns 'excess' revenues. This is an inflammatory remark which, to the lay reader not cognizant of the intricacies of the economic modelling (itself not described in the report) would appear to indicate that AQWEST overcharges. On any comparison of AQWEST's fees (undertaken in AQWEST's submission, but not by the ERA in its draft report), AQWEST performs well compared to its peers. Also on page 131, the ERA presents the results of modelling with a zero asset base, noting the large reductions in revenues that would occur (supposedly without impacting on the sustainability of the business). What it does not say is that its own consultants (ACG 2005, p9) suggest that reducing the notional regulatory asset value below $10 million:
"within a more commercial operating environment would further erode these financial indicators and potentially reduce the financial status of the business below a level that might be acceptable to government".
It is not clear why the ERA has chosen not to present this component of the consultants' findings in its Draft Report, and AQWEST considers this to be substantially misleading, particularly as the consultants' report was removed from the ERA's website soon after it was placed there, so that readers of the Draft Report are left with no way in which to assess the contentions of the report.

On page 133, the very low LRMC (not published in the Draft Report, but put at 18 cents per kilolitre in the consultants' report) is suggested to be due to the fact that AQWEST has a lot of spare capacity (which is untrue, and it is unclear how the ERA has come to this view, as no evidence to support it has been provided) and has abundant water supplies available locally. Whilst AQWEST concurs that its future source development costs are substantially lower than some of those of the Water Corporation, it was inconceivable as to how this could account for a LRMC one fifth of that calculated for the Water Corporation. In fact, subsequent discussions with the ERA and its consultants indicate that this very low figure resulted from some double counting of capacity by the consultant, as well as an application of the methodology used to proxy LRMC inconsistent with the consultants' own cited reference, some rather limiting assumptions surrounding variable costs and substantial under-estimation of the cost of the capital required. AQWEST cannot understand why the ERA did not question its own figures before using them in a public document, given the difference between their results and those found elsewhere in WA and globally.

The derivation of the WACC components for AQWEST (and the Busselton Water Board) on pages 185-6 is poorly explained and poorly justified. The WACC is the same as that for the Water Corporation, and it would appear, from casual inspection, that the ERA has simply decreased the equity beta and gearing of the Water Corporation, such that the net effect of the changes is to render the same WACC. Given that data exist on actual gearing levels for small water utilities, which are traded in the marketplace in the UK and hence have market-derived betas, this omission is curious. The same might be said for the discussion on the Water Corporation as the ERA has relied on other regulatory decisions to determine a beta for the Water Corporation rather than assessing market-based betas from similarly sized water utilities that are actually traded in the market overseas.

Issues Associated with the Consultant's Report

This section focuses on a technical assessment of the two main findings of the consultants' report; the regulatory asset base and the LRMC. It makes clear the assumptions underpinning the results, and alters some of these assumptions to reflect input data AQWEST considers more appropriate. The major criticism is not of the consultants' report which, apart from a few factual and computing errors, followed established methodologies in making its findings. Rather, it is in the use of these findings by the ERA, and the lack of any real sensitivity analysis (to probe the importance of key underlying assumptions) or reality checks on the results.

Regulatory Asset Base

The regulatory asset base determined by consultants is based upon the notion that the value of an asset is equal to the net present value of the expected revenue stream associated with that asset. This is not only based in sound economic theory, but is also representative of how assets are valued in real world markets; when buying a business, the potential buyer considers not how much the current owner spent to build up the business, but how much he thinks he could earn if he purchased it. The model used by the ERA's consultants essentially takes a revenue stream (AQWEST's actual revenue stream is used) a cost stream and then the NPV of both. It then back-solves the asset value and the depreciation payments in an Excel spreadsheet.

The result, when AQWEST's actual revenue stream is used, is a notional asset value of $16 million at the outset of the period, rising to $26.5 million after five years. The book value of AQWEST's assets is $45 million, a substantially higher figure.[7] At first glance, this appears to indicate that AQWEST has substantially over-invested in its infrastructure, and this is certainly the impression the ERA gives when it describes AQWEST's revenue forecasts to be 'substantially in excess of the minimum level necessary to sustain the business' (ERA 2005, p131). However, this is simply not correct, and it is not clear whether the ERA has correctly understood the use of the regulatory asset base. The purpose of economic regulation is to ensure that prices do not exceed those considered reasonable, allowing firms to extract monopoly rents. It is prices, not asset bases, which are the key concern of regulators (and indeed, were supposed to form the basis of this inquiry), and the notional values ascribed to assets in a regulatory model are irrelevant. A lack of focus on prices, consistent throughout the ERA's assessment of AQWEST, leads the ERA to erroneously and unfairly cast a negative perception on AQWEST's business, with careless statements such as that quoted above. When one focuses on the prices which come from the consultants' regulatory model, a quite different outcome emerges. This is summarised in Table One. The 'price caps' referred to are the prices which would result if the consultants' revenue and cost forecasts are combined with AQWEST's demand forecasts over the five year period (see AQWEST's previous submission). Regulators utilising an incentive-based scheme of regulation commonly do not set prices, but rather set price caps, allowing prices to fall below the cap if the regulated firm is able to cut costs and offer lower prices to some or all customers.

Table One: Price Caps, Costs, Fees and Asset Values

[7] Discussions with the regulator indicate that similar differences exist between the book value and regulatory asset bases calculated for Busselton Water and the Water Corporation, although the discrepancy is not so large in the case of the latter.

	2003/04 Budget	2004/05 Projection	2005/06 Projection	2006/07 Projection	2007/08 Projection	2008/09 Projection
$16 million asset value price caps	$0.77	$0.83	$0.82	$0.86	$0.91	$0.93
$10 million asset value price caps	$0.69	$0.75	$0.75	$0.78	$0.83	$0.86
Zero asset value price caps	$0.56	$0.62	$0.62	$0.66	$0.71	$0.74
LRMC (total)	$0.91	$0.77	$0.73	$0.66	$0.78	$0.70
LRMC (residential)	$0.94	$0.81	$0.76	$0.69	$0.82	$0.73
Av Fee (residential)	$0.79	$0.79	$0.79	$0.79	$0.79	$0.79
LRMC (non-residential)	$0.81	$0.66	$0.66	$0.60	$0.71	$0.63
Av Fee (non-residential)	$1.12	$1.10	$0.99	$0.99	$0.95	$0.92

Price caps from the consultants' model. LRMC figures and fees from AQWEST's previous submission.

By the end of the period, AQWEST's costs and fees (except for non-residential customers, an issue addressed in AQWEST's original submission) match those of the zero asset value price cap scenario reasonably closely, and they are substantially lower than the price caps implied by the $10 million and the $16 million asset base. What concerns AQWEST's customers, and what *should* concern the regulator is the prices they are charged. By the end of the regulatory period, an average AQWEST residential customer will be eight percent better off, in terms of the prices faced, compared to the benchmark which the consultants have chosen of a commercial firm with a regulated asset base of $10 million and gearing of 40 percent. For AQWEST's consumers, this is a much more important benchmark than the asset base focus of the ERA. AQWEST suggests that the final report be reflective of the impacts on prices, and not on notional asset values, which confuse the key issue of economic regulation.

The value of an asset is equal to the expected revenue stream accruing to that asset. A key part of this phrase ignored by the ERA is the term 'expected'. The ERA has taken AQWEST's current revenue stream as being indicative of the expected revenue from a water utility operating in Bunbury, making no assessment of whether this revenue stream is efficient or reasonable. However, if any reasonable type of benchmarking analysis is to be undertaken at all, at least some cognizance must be given to the revenue an alternative service provider, faced with the demand scenario of Bunbury, would earn, given the prices it could set. Otherwise, there is no way of ascertaining whether the modelling results are in any way reasonable. The undue focus by the ERA on AQWEST maintaining its current revenue stream has missed this vital point. Table Two provides a summary of the revenue earned, per customer by AQWEST's peers. These form a simple benchmark to ascertain the types of revenues which a notional competitive firm supplying water in Bunbury could earn. AQWEST acknowledges that better benchmarks may be available, but the very tight timeframe available to respond to the ERA's Draft Report did not allow for the development of more sophisticated benchmarks, a task which, in any case, AQWEST considers to be the proper role of the ERA.

Table Two: Revenue per Customer Benchmarks (2002/03)

	Revenue per customer
Barwon	$ 848.65
Central Highlands	$ 894.95
Coliban	$ 755.73
Gippsland	$ 825.83

Goldburn Valley	$ 1,053.49
North East	$ 717.42
Western	$ 1,055.41
East Gippsland	$ 746.48
Glenelg	$ 632.54
Grampians	$ 886.71
Lower Murray	$ 797.27
Portland Coast	$ 803.22
South Gippsland	$ 853.79
South West	$ 762.95
Westernport	$ 1,001.75
City West	$ 913.04
South East	$ 678.20
Yarra Valley	$ 604.24
Melbourne Water	$ 346.89
AQWEST	$ 609.66
Average (not including AQWEST)	$ 798.87

Source: Vicwater (2004)

If water was priced in Bunbury such that it was equal to the average price amongst AQWEST's peers, it would be approximately 31 percent greater, on a per customer basis, than AQWEST's revenue is at present.[8] The Vicwater Survey (2004) does not break down revenues into revenues from customers, developers and so on, as in Table 3.2 of the consultants' report (ACG 2005, p8). However, applying a grossing up figure of 31 percent to the revenue stream used in the consultants' model, and then using this to derive an asset value gives a regulatory asset value at the start of the period of $36.7 million, rising to $46.4 million by the end of the period. More importantly, the price cap for the period under this scenario is $1.11. Although AQWEST believes that the appropriate point of analysis is on the adequacy of prices, and not the size of the regulatory asset base, it is useful to note that, were AQWEST to price as its peers do, the resultant regulatory asset base would be only slightly less than the book value of its assets.

One further method of deriving price caps is possible. The ERA's consultants have based their asset valuation methodology on revenue streams, and used these to derive a regulatory asset base. However, most regulatory decisions around Australia establishing price caps do not work in this fashion, due largely to the difficulties of predicting expected revenue streams. Rather, they start with a reasonable estimate of the asset base, add in capital, depreciation and operational and maintenance costs, to then derive a revenue stream and price cap.[9] Utilising a book value of AQWEST's assets of $45 million in the consultants' model results in a price cap of $1.22.

Thus, when considering, as AQWEST believes an economic regulator should, the issue from the perspective of price, rather than the arbitrary notion of a regulated asset base, the 'appropriate' price for AQWEST to be charging lies somewhere in the range of $0.77 per kilolitre (the average over the five years which would be achieved by the

[8] This average does not include AQWEST. If AQWEST is included, the figure drops to 29 percent above AQWEST's current per-customer revenue.

[9] The NCC, for small utilities, suggests the book value of the assets as the relevant asset base.

consultants' 'commercial' proxy[10]) and $1.22 per kilolitre, which is the price cap under the scenario whereby the ERA regulates AQWEST in the same manner as it regulates other utilities in WA. Ultimately, the Minister sets AQWEST's prices, with the ERA merely providing guidance. However, given the importance of benchmark competition (widely used by regulators around the world), AQWEST considers that the benchmark figure of $1.11, or a similar figure derived through a more sophisticated benchmarking exercise, would make a useful price cap for the ERA to use in its advice.[11] As noted elsewhere, AQWEST considers that such price caps, if the ERA is actually serious about its commitment to light handed regulation, should be for a basket of AQWEST's services and not on a service-by-service basis.

The "Optimised" Model of a Water Utility

The consultants suggest that, whilst the structure of AQWEST results in a regulatory asset base of $16 million, a more 'commercial' operation,

"under a financial structure more typical of such a business and with more commercial operating requirements" (ACG 2005, p8)

would result in an asset base at the outset of the regulatory period of only $10 million. It is suggested that this operation would hold 40 percent debt, with concomitant reductions in cash reserves, and would pay out between $0.5 and $1 million per annum in dividends. The consultants suggest that reducing the asset base further would be unlikely to be acceptable to government.

The key driver appears to be the requirement to take on 40 percent debt, which seems to be a pre-conceived notion of what is appropriate for AQWEST (despite the strong views of its Board and customers), espoused by the ERA from the outset of the inquiry. However, it is not clear why this level of debt is considered optimal.[12] Table Three summarises the debt levels of AQWEST's peers.

Table Three: Gearing Benchmarks (2003/04)

	Gearing Ratio (debt/equity)
Barwon	6.4%
Central Highlands	0.2%
Coliban	10.8%
Gippsland	0.0%
Goldburn Valley	2.6%
North East	2.0%
Western	3.9%
East Gippsland	0.0%
Glenelg	1.5%
Grampians	1.1%
Lower Murray	0.3%
Portland Coast	3.2%
South Gippsland	0.0%
South West	8.5%

[10] This, as discussed previously, is the minimum asset value which the consultants' suggest government would find prudent (see ACG 2005, p9). For this reason, AQWEST believes that the consultants' $10 million asset base scenario should be the minimum price cap.

[11] However, were the basket approach to be used, AQWEST's average price (its LRMC) to all customers, of 70 cents per kilolitre, is below all the benchmarks by the end of the five year period.

[12] The source of the interest rates assumed is also unstated, and they seem low, given that interest rates are rising at the moment.

Westernport	5.2%
City West	22.1%
South East	29.0%
Yarra Valley	40.5%
Melbourne Water	21.9%
AQWEST	0.0%

Source: Vicwater (2004)

Only very large utilities (such as Yarra Valley Water) have debt levels as high as 40 percent, so it is not clear why this figure has been used, nor what firms the consultants have used as benchmarks. This is not say the benchmarking exercise is completely false, but its basis should be more clearly explained, particularly in light of the substantial differences between the benchmarks AQWEST uses (cited in its previous submission) and those used by the consultants. Moreover, the assumption that AQWEST can easily alter its gearing in this manner is false. A commercial company, if it wishes to raise capital and does not wish to risk further increases in debt, can issue equity. AQWEST is specifically prohibited from issuing equity by its governing legislation, so increasing debt in the manner suggested carries much higher risks for it than it would for a similar private organisation, not covered by AQWEST's governing legislation. There is no consideration of this risk, which may change, for example, the credit rating assumed. Indeed, a key driver in the AQWEST Board's decision not to raise debt was its practical experience with the consequences of these risks during the 1980s. This was clearly enunciated in AQWEST's original submission to the inquiry, but its ramifications have been ignored in the consultant's report.

Cost Allocation

The consultant's report suggests that:
"AQWEST does not allocate its operating costs to its different classes of customer. As such, the prices levied on different customer groups are not based on any estimate of the costs of servicing them" (ACG 2005, p26)
However, this conclusion is based on 2003/04 data. As AQWEST noted in its submission, it is currently in the process of converting its charging regime to one more reflective of costs incurred by serving a particular customer group. Moreover, over the coming five years cost allocation is on a path to match costs by consumer group by the end of the regulatory period. This reverses the consultant's findings to a substantial degree, though AQWEST acknowledges its cost allocation mechanisms are still not perfect by the end of the period as it is still refining its own cost-based pricing methodology. AQWEST understands that the consultant's report was prepared prior to the December submission of AQWEST. However, the ERA has had three months to incorporate the new data provided by AQWEST, but has not done so. It is hoped that this will occur in the final report, particularly since it has a material effect on the conclusions drawn in this chapter of the consultants' report. AQWEST has not made any detailed comments on Chapter Six, as it understands from the ERA that the chapter will be revisited by the ERA for the final report, in line with data provided by AQWEST three months ago.

Short Run and Long Run Marginal Cost

In its submission, AQWEST noted that the ERA had made no distinction as to what precisely constitutes the short run and the long run. AQWEST suggested that an appropriate distinction was approximately one year, which excludes most of the

capital items commonly considered to be longer term expenditures. The ERA's consultant uses a much more narrow definition; one extra kilolitre of water.[13] As such, the only variable costs considered are sufficient electricity to pump the water (to where in AQWEST's network is not specified) and sufficient chemicals to treat it. This, quite naturally, gives a much lower estimate of the short run marginal cost. However, it excludes a number of costs which could be potentially incurred with one extra kilolitre of water being produced. For example:

- If the one extra kilolitre is produced for a new customer, this requires a new bill be prepared (and potentially a new connection and meter), which is substantially more costly than seven cents.
- If the extra kilolitre puts pressure on some part of the network, bursting a pipe, this also adds substantial costs to AQWEST.
- If the additional kilolitre requires an AQWEST staff member to work overtime (the units of which are hourly, not continuous, so AQWEST may incur one hour of overtime for one extra kilolitre delivered) then costs rise.
- If the additional kilolitre of water means a treatment plant reaches capacity, then the costs increase substantially.
- If the water is produced during a period of peak daily demand, this results in different costs than if it is produced in an off-peak period.

There are many more costs which may be incurred, depending exactly when and where this kilolitre is produced. This could perhaps be addressed by incorporating these costs, and multiplying each by the probability that it is likely that a single additional kilolitre causes AQWEST to incur these costs. This is likely to be prohibitively difficult to calculate, but at the very least, the discussion around short run marginal cost should make it clear what is being excluded and note that it refers only to one extra kilolitre of water, purchased by an existing customer during the off-peak time of the day, the delivery of which places no stresses on any part of the network, and requires no extra work by any member of AQWEST's staff. It is certainly not the costs that AQWEST would incur if a new, unconnected customer rang them up and asked for a kilolitre of water to be delivered to their doorstep. The consultant's report does not make this clear and, whilst it may be clear to the regulator, if the document is to be made public, it certainly does not make this distinction clear to a lay reader.

The estimate of long run marginal cost has been prepared utilising the methodology of the long run average incremental cost (LRAIC), which proxies what it would cost to service the last unit of demand, in AQWEST's case, in 2030.[14] It does not take into consideration that new demand will also utilise some of the existing capital (such as treatment plants). It also does not take into account what it will cost to service any of the existing demand. However, to the extent that the costs of servicing new and existing demand are similar, estimates including current demand and future demand should be of roughly similar orders of magnitude, although one might expect some decreases if economies of scale were being realised, or increases if higher-cost

[13] In fact, Table 7.1 in the consultants' report (ACG 2005, p28) takes the variable costs of electricity and chemicals and divides these by total water consumed. As such, the costs shown are not marginal costs, but short run average variable costs

[14] Actually, it represents the average cost of serving the incremental units of capacity in the last 'tranche' of demand but, provided costs are linear over this tranche, it will be the same as the true LRMC for the period.

sources of supply needed to be utilised. It is for this reason that the consultants' figure of 18 cents per kilolitre (against AQWEST's LRMC calculations of approximately 70 cents in its previous submission) seems so counter-intuitive, and the explanation on page 27 (repeated by the ERA in its draft report) that this is low solely because 'there is no need for AQWEST to locate and develop new sources of water to satisfy demand' does not seem credible.

A more likely explanation appears to be some of the assumptions made by the consultants in their calculations. In particular, three key differences of opinion between AQWEST and the consultants are apparent.[15] Firstly, the operational expenditures used by the consultants were based on per kilolitre operating costs of 11 cents per kilolitre (ACG, p31), which the consultants suggest is derived from current (2003/04) data. Subsequent discussions with the consultants reveal that these costs represent only chemical treatment costs, operation of bores and maintenance and electricity; essentially, the limited set of short run variable costs identified. AQWEST contends that, in the long run, these are not the only variable costs. As such, in Table Five, additional figures for LRAIC are provided which include all of AQWEST's operational expenditures (basically the three line items used by the consultants, plus staffing costs and other materials) and also AQWEST's administrative expenditures. AQWEST believes all three are variable in the long run.

The second difference lies in the forecasts for capital costs in Table 7.2 (ACG 2005, p30). These were not based on information provided by AQWEST. AQWEST recently had quotes prepared, by Halliburton KBR, for treatment plants very similar to those in Table 7.2. Rather than simple estimates, these were robust cost quotations, for plant AQWEST planned on installing, and are thus considered to be substantially more accurate. Table Four provides further details.

Table Four: Long-Range Capital Programme, AQWEST Predictions

Year	Project	Cost ($m)	Additional Capacity (kL per day)	ACG figures
2005/06	Minor treatment plant upgrade	0.75	2000	0.75
2009/10	New treatment plant and bores	4.002	6000	2.2
2019/20	New treatment plant and bores	5.335	8000	2.5

Source: Halliburton KBR, 2002, "Glen Iris Water Treatment Plant - Value Engineering Report for AQWEST"[16]

For the purposes of assessing like with like, AQWEST has not, in its recalculation of LRAIC, questioned the nature of the capital upgrades the consultants suggest are appropriate. However, there are serious flaws in this assessment as well. In particular, the consultants have not taken into account the spatial nature of AQWEST's network; the area in which the new demand is predicted to occur is largely in the north of the network, and the area where it is feasible to establish new

[15] There is also an error of fact on page 28 of the consultants' report; AQWEST did consider the long term capital requirements of servicing new demand over 30 years; these were included in the capital expenditure forecasts provided in its submission. In fact, AQWEST plans its asset replacement and augmentation on a hundred-year cycle.

[16] This report is available for viewing by the ERA on a commercial in confidence basis, if the ERA so desires. Recent discussions with industry figures indicate that plant costs have increased by some 40-60 percent since these quotes were provided. However, this is due largely to temporary constraints in the construction industry in WA.

bores and treatment plant is largely in the south. Water for new demand needs to be pumped through the network, and this requires upgrades to existing capital; the consultants' impression (not gained through discussions with AQWEST) that it has spare capacity in its network for this new demand is simply incorrect. AQWEST can provide input data to improve the modelling for the final report if requested to do so.

A third difference is the use of capacity, rather than actual water production, as the appropriate measure of quantity. In the reference cited by the consultants (Warner, 1996, p6&7), the use of consumption, not capacity is recommended. Moreover, the UK water regulator, which has undertaken substantial work on the estimation of LRMC for water utilities states that the average incremental cost approach (LRAIC): *"estimates LRMC as: the present value (PV) of the expected extra costs of the optimal strategy divided by the PV of the changes in the supply/demand balance in terms of additional volumes of water (a) supplied through additional supply schemes (not their capacity), and/or (b) saved through additional demand management options"* (OfWat, 2001 p38).

It is not clear why the consultants have used capacity rather than water supplied, particularly given the issues associated with demand being less than capacity, which are discussed below. AQWEST has re-calculated the LRAIC figures of the consultants using water produced, itself a slight increase over water consumed, due to line losses, but not nearly as much of an overstatement as capacity.[17]

Table Five: Long Run Marginal Cost, Recalculated

Years	Capital expenditure	Operating Expenditure $m (incl. admin)1	Operating Expenditure $m (excl. admin)1	Operating Expenditure @ 11cents/kL	Additional Demand (GL per year)3
Rate Per k/L		*0.48*	*0.30*	*0.11*	
2005/06	0.75	0.04	0.03	0.01	0.09
2006/07	0.00	0.08	0.05	0.02	0.18
2007/08	0.00	0.13	0.08	0.03	0.27
2008/09	0.00	0.17	0.11	0.04	0.36
2009/10	4.00	0.22	0.14	0.05	0.46
2010/11	0.00	0.27	0.17	0.06	0.56
2011/12	0.00	0.32	0.20	0.07	0.67
2012/13	0.00	0.37	0.23	0.09	0.77
2013/14	0.00	0.42	0.26	0.10	0.88
2014/15	0.00	0.48	0.30	0.11	1.00
2015/16	0.00	0.54	0.33	0.12	1.11
2016/17	0.00	0.59	0.37	0.14	1.23
2017/18	0.00	0.65	0.41	0.15	1.36
2018/19	0.00	0.71	0.44	0.16	1.48
2019/20	5.34	0.77	0.48	0.18	1.61
2020/21	0.00	0.84	0.52	0.19	1.74
2021/22	0.00	0.90	0.56	0.21	1.88
2022/23	0.00	0.97	0.60	0.22	2.01

[17] Calculations were also made using capacity as the relevant measure of quantity, which gave an LRAIC of 28 cents per kL using the consultants' operating expenditure of 11 cents per kilolitre, 47 cents per kL if AQWEST's actual operating expenditure in 2003/04 is used, and 65 cents if AQWEST's operating expenditure and administrative expenditure is used. In these calculations, the consultants error of double counting the capacity of each treatment plant and bore was fixed.

2023/24	0.00	1.04	0.65	0.24	2.16
2024/25	0.00	1.11	0.69	0.25	2.30
2025/26	0.00	1.18	0.73	0.27	2.45
2026/27	0.00	1.25	0.78	0.29	2.60
2027/28	0.00	1.32	0.82	0.30	2.75
2028/29	0.00	1.40	0.87	0.32	2.91
2029/30	0.00	1.48	0.92	0.34	3.07
NPV	5.70	6.16	3.84	1.41	12.83
		Operating Expenditure $m (incl. admin)1	***Operating Expenditure $m (excl. admin)1***	***Operating Expenditure @ 11cents/kL***	
LRAIC (cents per kL)		***92.49***	***74.38***	***55.44***	

The re-calculated LRAIC lies somewhere between 55 cents per kilolitre and 92 cents per kilolitre, depending upon the definition used for operational expenditures. By comparison, the LRMC calculations in AQWEST's original submission ranged from 91 cents per kilolitre in 2003/04, down to 70 cents per kilolitre in 2008/09. These are slightly higher, which suggest that, as AQWEST expands output over the coming 25 years, it will be able to reap some small economies of scale.[18]

Long Run Marginal Cost and Pricing

The consultants' report does not mention pricing, and indeed the ERA makes no mention of pricing recommendations for AQWEST specifically. However, the Draft Report makes repeated references to the need to price at LRMC, noting that a LRMC of a dollar a kilolitre is appropriate for the Water Corporation, and it seems likely that some form of LRMC-based pricing may be applied to AQWEST in the future. It is for this reason that comments are made concerning the appropriateness of LRMC as a basis for pricing in the case of AQWEST.

The economics of the ERA's arguments that LRMC-based pricing promotes economic efficiency are sound; provided setting price equal to LRMC occurs at the point at which the LRMC curve meets the average total cost curve, not only is pricing socially efficient, but it also allows the regulated firm to recover all of its fixed costs, and is hence sustainable in the long term. The issue is not with the underlying economic theory, but with its application. Two flaws exist in the ERA's analysis:

- The calculations carried out by the ERA's consultants are not LRMC but, as the consultants state in their report, they are the long run average incremental cost (LRAIC). The difference between the two is subtle, but can be important.
- Underlying the ERA's case is an implicit assumption that overall demand for water is much greater than supply, and hence AQWEST could expand output instantaneously to meet demand at whatever price cap is set. This is not necessarily true, and may have profound consequences for the sustainability of AQWEST's business.

[18] In its previous submission, AQWEST noted that there did not appear to be many economies of scale in water production, based upon a cross sectional analysis of AQWEST's differentially-sized peers. The analysis in this submission, ranged over a longer timeframe, suggests that this may not be accurate, however AQWEST notes that the required capital assumptions (here based on the consultant's suggestions and based on AQWEST's own projections in the previous submission) are not the same. However, the economies of scale do not appear to be substantial, particularly when the upper range of the figures is used.

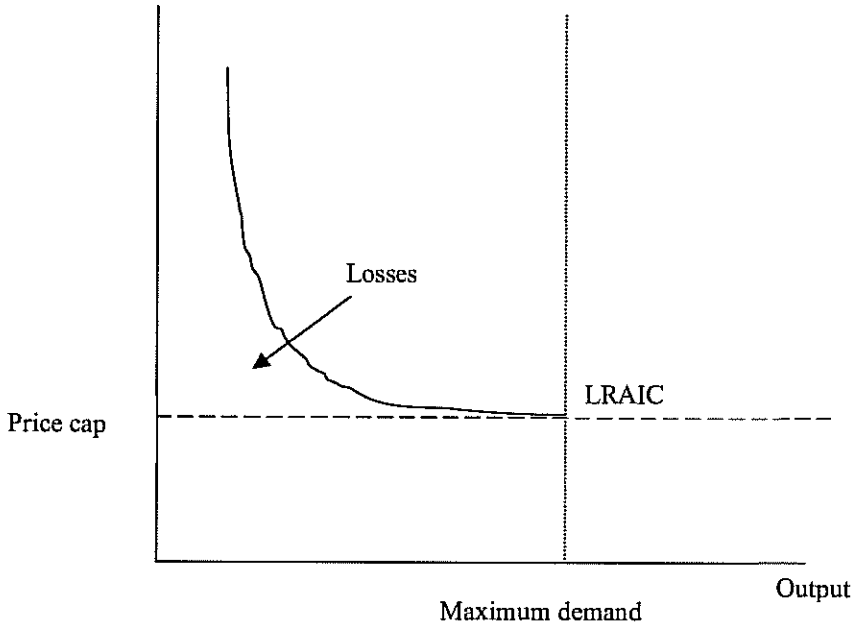
In economic theory, the LRMC is the derivative of the cost function. This seems simple but, in reality, developing a reliable proxy for LRMC is highly problematic. In its submission, AQWEST proxied LRMC by using long run average costs, an approximation which only holds under certain circumstances (see Appendices for details). The LRAIC used by the consultants is also not exactly the same as the true LRMC. What it represents is the marginal, that is, the incremental variable costs, plus a portion of average total costs, averaged over the likely demand (in the case of the ACG report, capacity) in each year. In a sense, it is something of a combination of incremental variable cost and average incremental fixed cost. This is important. If a price cap is set at a level above LRMC, then this is not necessarily problematic; provided it is at or below average total costs, the regulated firm will not be earning a monopoly rent but will rather be recovering some (all if the price cap equals average total cost) of the fixed costs of production. However, if the price cap is above LRAIC, then monopoly rents will be earned by the regulated firm. The use of LRAIC is not necessary fatal to appropriate regulatory pricing, but it needs to be kept in mind that it is not the same as the true LRMC, to which the ERA refers in its report.

A much more important issue from the perspective of AQWEST is that a price cap set equal to some point on the LRAIC curve is sufficient for the regulated firm to recover all of its costs and allows the firm to earn no economic rents, provided the firm is able to produce the relevant output level to that point on the LRAIC curve. If the regulated firm produces less or more than that output level, depending upon the shape of the LRAIC curve, it may earn monopoly rents, or may be forced out of business by being unable to recover costs. This latter point is particularly pertinent for AQWEST, as is discussed below.

If LRAIC is constant (that is, if total costs are linear over the relevant output range), then no issues arise, as the LRAIC will be the same regardless of the level of output. However, LRMC curves, and hence LRAIC curves, are rarely horizontal. Rather, they are generally U-shaped, as economies of scale and later scarcity influence the production function. Moreover, differences occur depending upon whether the regulated firm is on the declining or the increasing portion of the LRAIC. Consider the declining portion of the curve first, in Figure One.

Figure One: Declining LRAIC

LRAIC

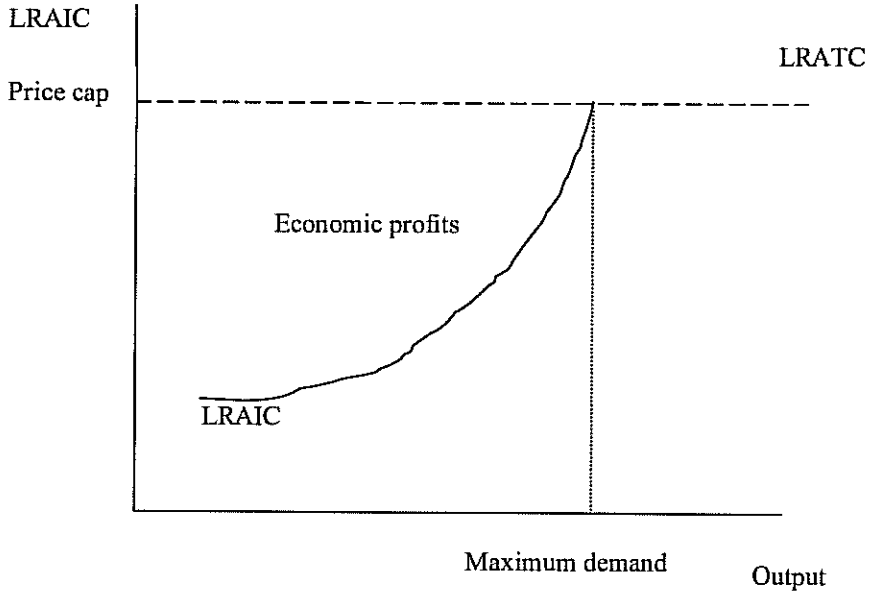


In this situation, when the LRAIC is calculated for the relevant range of output via the consultants' methodology, the result is equivalent to the price cap line in the diagram above; it represents the average incremental cost of the last unit of output, as it should. If a firm faces a large market, and can hence increase output immediately to meet the point at which the LRAIC curve meets the price cap line (along the maximum demand line above), it will optimise output in this fashion, and it will price all of its units of output at that level. Moreover, in so doing, it will earn returns sufficient to cover all of its costs. However, if the firm does not optimise but produces any output less than the maximum demand line in the diagram above, it will earn losses, which will be equivalent to the vertical distance between the LRAIC curve and the price cap line. A rational firm would never do this, if sufficient demand existed. However, it may be forced to do so if sufficient demand did not exist (or could not be serviced in time, say because investment in capacity is time consuming). That is, where demand is constrained, a price cap equal to LRAIC may cause the regulated firm to suffer losses and, in extreme situations, bankrupt the firm. This is crucially important in the water industry. Quite apart from government policy directives to reduce demand, water demand is commonly strongly linked to population growth. A water utility operating in a confined geographical market faces demand limited by the growth of the population it serves; expanding capacity may result in no extra revenue as the demand simply does not exist. There is no reason to suspect that the implicit assumption of the ERA in advocating pricing at LRAIC, that the regulated utility can optimise production at the price cap, is correct. When this is the case, a substantial risk to the sustainability of the relevant utility (facing a downward-sloping LRAIC curve) exists.[19]

The converse case, where the LRAIC curve is increasing, is shown in Figure Two.

Figure Two: Increasing LRAIC

[19] Note also that this phenomenon is not an artifact of the use of LRAIC, rather than LRMC. Even if the ERA were able to estimate LRMC perfectly, it would still occur, unless, as suggested below, different price caps as each successive level of demand is reached, were employed.

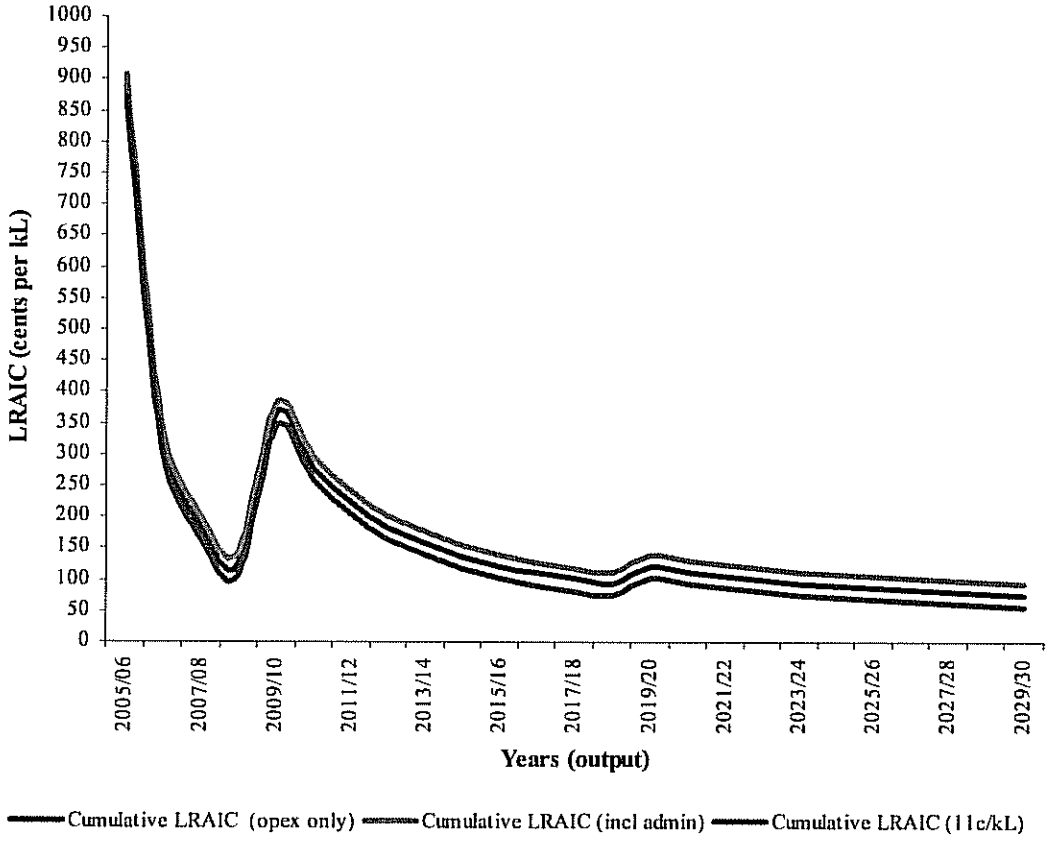


In this case, if the price cap is set at the LRAIC calculated for the period as a whole, it will act as a maximum, rather than a minimum. If the regulated monopoly is provided with a price cap which, at its current level of output less than the maximum demand level, is above its LRAIC curve at that level of output, it will earn economic rents equal to the vertical distance between the LRAIC and the price cap. Depending on the amount of total revenue earned, it may in fact pay the regulated firm to not increase its output to the maximum demand level, and earn economic rents on a lower output. If government has a policy to reduce water demand, this may represent one way of achieving this, at the cost of some monopoly rents to the relevant utility. However, perhaps more fundamentally; if the LRMC curve (and hence LRAIC curve) is upward sloping, the minimum efficient scale of operation is at low, not high levels of output, and it is not clear why such an entity should be regulated by an economic regulator. This does not appear to have been considered by the ERA, even though, on page 40 of its Draft Report, it seems to indicate that the Water Corporation is facing increasing LRMC.[20]

The key question for AQWEST is what part of its LRAIC curve is it facing? As seen in Table Five, the LRAIC figures derived once more accurate input data are used are not substantially lower than the costs of servicing current capacity. They are, however, lower. Figure Three recalculates the consultants' LRAIC, taking each year in turn as the final year of analysis, to obtain a rough idea of the shape of the LRAIC curve. The use of time and output on the horizontal axis reflects the fact that AQWEST's demand expands with time, as it is constrained to serving Bunbury.

Figure Three: Changing LRAIC Over the Planning Period

[20] However, some portion of the business, most likely the distribution pipes, is likely to still be a natural monopoly, without upward-sloping LRMC curves. As such, the rationale for regulating that portion of the business remains, along with a need to consider re-structuring the business, as occurred with electricity and gas. This issue is not raised by the ERA.



The LRAIC is clearly decreasing, particularly because demand expands slowly, meaning it takes many years for it to expand to the point where it reaches the capacity of the relevant plant.[21] This is critical from the perspective of pricing. If the ERA were to set prices equal to the LRAIC even the figures calculated in Table Five, using correct input data, AQWEST would incur losses every year until 2030, when its LRAIC reaches the price cap. These losses may be sufficient to endanger the sustainability of AQWEST's business, resulting in risks for both the people of Bunbury and, potentially, the State Government, similar to those which existed during the early 1980s, when AQWEST's financial viability was at its nadir.

To avoid losses government could allow AQWEST to expand its business by removing the governing legislation which does not allow it to do so, or could provide a government subsidy. The first option would involve an increase in AQWEST's risk profile, and would thus change the price cap. Moreover, AQWEST may still incur losses as it develops new business. The second option seems perverse; why set a price cap at a level which does not allow AQWEST to recover its LRAIC immediately, and then provide government subsidies? This leads to a potential third option; set a different price cap in each year. In fact, to the extent to which the LRAIC curves of water utilities are decreasing, to preserve the economic efficiency of LRMC pricing without jeopardising the sustainability of the business, that is precisely what the regulator would have to do; alter the price cap in each and every year.

[21] If, as in the consultants' report, capacity rather than production is used, Figure Three preserves roughly the same shape, but without such attenuated extremes, as capacity is above demand in the years immediately following the installation of new capital.

An annual change in the price cap (particularly one which would necessarily increase and decrease with new assets added to the asset base as shown in Figure Three) would become highly confusing for customers and would complicate immensely the operations of water utilities, particularly if future price caps were unknown. A benchmarking approach involving a price cap such as that suggested previously seems much more reasonable; that is, establish a benchmark price (or better yet, a benchmark price for the basket of services provided) for a world's best practice water utility in year zero. This price should then be allowed to vary in the future according to a CPI-X methodology, without requiring periodic re-evaluations of the asset base. Academic research supporting this approach was recently presented at the Utility Regulators' Forum (see Bloch, Kenyon & Wills-Johnson, 2004), and it appears to be the direction in which the thinking of regulators in Australia are moving (and indeed the original idea of price cap regulation, as promoted by Stephen Littlechild in 1983).

Whilst the approach of the ERA to endeavour to set prices at LRMC is good economic theory, the practical adaptation of this theory is substantially flawed, and AQWEST considers that it would be a retrograde step to implement such a pricing mechanism, particularly when incentive-compatible, light-handed regulatory mechanisms are available. The case for the intrusive, costly and heavy-handed approach of the ERA is poorly made in its Draft Report, particularly given that the report makes no mention of the difficulties mentioned above.

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