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Memorandum

Date:

To: Ursula Kretzer, Economic Regulation Authority

Cc: Greg Watkinson, Economic Regulation Authority

From: Paul McLeod

RE: Consultancy Memo on Cost Reflectivity of Various Minor Tariffs and Demand Risk

Introduction

In its review into tariffs of the water corporation Aqwest and Busselton Water the economic regulation authority identified a range of tariffs that appear to be inconsistent with the core recommendations on water tariffs.

A previous memo looked at the range of these tariffs and whether there is a justification for them in their current form.

For some of these tariffs, cost reflectivity is an issue. This memo considers the question of cost reflectivity further.

In setting Water Corporation prices, the Economic Regulation Authority has regard to the water demand forecasts made by the Corporation. An important issue is the accuracy of these forecasts and whether the Corporation should bear any of the risk associated with forecast inaccuracy over the regulatory period. This issue is also considered in this memo.

Metropolitan Standpipes

The standard metro non-residential usage charge for water is a three tiered charge per Kl as shown below. This charge is for potable water.

Usage (kl)	Price
0 – 600	98.3 c/kl
601 – 1,100,000	104.3 c/kl
over 1,100,000	102.8 c/kl

The major use of metropolitan standpipes is land developers using water for dust suppression. There is no reason to believe that supplying this water is more or less costly than supplying equivalent water to other metropolitan non residential water users. The portable standpipes are affixed to the normal water supply system.

These portable standpipes are metered and the charge of $1.043 per kL is levied, the second tier of the schedule. No separate costing of standpipes has been undertaken. The price is effectively an "opportunity cost" price. Because it is based on the current full commercial price schedule this tariff is effectively only cost reflective insofar as the costing done for the determination of the metropolitan non residential tariff is cost reflective. Therefore this charge does not reflect either short run or long run marginal cost for potable water supplies but is reflective of average cost as are most prices set by the Water Corporation.

Industrial Waste Charges

A range of volume and service charges apply in respect of non domestic waste.

Industrial waste discharged into the sewers of the Corporation pursuant to a major permit is a uniform state-wide charge based on the volume of discharge, the composition of the discharge and the quantity of contaminants in the discharge: For volume the charge is 111.0 c/kL. Above this charge varies with the nature of the discharge. The charge based on the nature of the waste varies from no charge for sulphate discharge with a concentration of up to 0.05 kg per kL or dissolved salts discharge with a concentration up to 1 kg per kL up to a charge of 342,465 c/kg for mercury discharge with a concentration of over 0.001 kg per day.

These charges are based on a cost analysis of the way various wastes affect the sewerage system. Costs considered are monitoring, treating waste, impacts on system operation etc. The costs were based on a consultancy undertaken for the Water Corporation that looked at:

- Chemical processes
- Bulk loads
- Transport and treatment costs

This analysis excluded the charges for heavy metals (e.g. mercury) as these are set by the DEP. These metals are not treatable.

It is important to note that firms cannot simply dispose of waste freely subject to paying the scheduled price. The disposal of waste is subject to a variety of complementary regulations. This regulatory process control affects the way firms handle chemicals, fats and other substances. For example, a firm may be required to install grease arrestors to capture most fats before discharge of residual waste to the sewer system. Captured fats must then be treated and disposed of through an alternative process. Firms must adhere to the various Water Corporation regulations as part of disposing of waste at the scheduled charges. This means that the full costs of waste disposal to the firm are greater than the charges for placing waste in to the sewer. The various wastewater charges therefore relate to wastes that comply with the various regulations.

The wastewater charges are based on a unit rate schedule that breaks down waste handling into various categories – in particular transport and treatment by type of waste by volume. On this basis case specific costing can be done if firms request it. For example if a firm has specific waste requirements in terms of composition and volume, a costing can be done based on the various stated unit rates and this then becomes the charge. Firms can pay the standard charge or seek a specific costing based on the unit rates.

From an efficiency perspective, where particular wastes add to costs, either because of volume or contaminants, efficiency dictates that the producer pay an appropriate price that reflects the marginal cost of dealing with that waste. Charging according to volume and contaminant is appropriate.

The current charges follow this logic and appear to be cost reflective based on studies of the average cost, as opposed to the marginal cost, of dealing with various wastes and volumes. The prices support the regulatory framework and cannot be looked at separately from it.

Industrial waste, including the major permit waste, requires a range of related specific services to be available. These are essentially to do with monitoring and evaluation including, for example, sampling wastes to check composition and evaluating a firm's production process (an audit type function). The services provided and their prices include:

Permit fee ($187.70);
Meter reading ($21.20);
Establishment fee – routine program or unscheduled visit ($105.50/hour);
Inspection fee – routine program or unscheduled ($116.05/hour);
Production evaluation – routine program – N/A;
Production evaluation – unscheduled visit ($132.40/hour);
Grab samples – routine program ($246.95);
Grab samples – unscheduled visit (at cost);
Composite samples – routine program ($579.70);
Composite samples – unscheduled visit (at cost);

Non-permit holders discharging industrial waste ($105.50/hour);
Discharging industrial waste from an open area ($1.25/square metre);
Fats, oils and grease management charge ($87.50), introduced in 2008/09.

The principle here is that these are specific services traceable to particular clients and particular wastes. They are consistent with a user pays approach to the handling of wastes. These charges are based on an activity costing. Each activity undertaken is recorded (time and materials) on job sheets. Unit time costs are applied to determine activity cost. The above charges are average costs based on the cost records and apply to average situations. If something atypical arises, such as more complex sampling requirement or metre reading then a specific costing would be done based on actual time sheets.

Most water companies dealing with waste disposal offer these services and it is standard practice to charge separately for them.

Discounts and Additional Charges

A range of commercial discounts are offered. These include:

Additional charges ranging from $1.50 to $3.00 if installment payment arrangements are made with the Corporation (does not apply to pensioners or seniors);

Interest on overdue amounts (13.99% per annum).

These are essentially commercial adjustments that are intended to be cost reflective of the payment arrangements they are designed to encourage/discourage. As such they are consistent with economic efficiency.

The installment arrangement appears to be set as for standard arrangements for installment payments. Up front cash payment in full is preferred. The installment payment needs to have the same present value as the up front cash payment. Hence the installment needs to be increased to achieve this. The charge varies according to the actual installment regime. The principle of a charge for installment payments is cost reflective in that delayed payment imposes a cost on the Water Corporation.

Overdue accounts not subject to an agreed installment account payment can have a penalty rate of interest applied. This rate is currently 13.99% and is based on the BankWest reference rate. The current BankWest business overdraft reference rate is 9.61% and the business market reference rate is 8.25%.

It is a common policy for companies and government agencies to charge interest on overdue accounts. Even where they choose not to, they usually have the right to make such charges. This issue therefore is more about how the rate is struck and whether the charge should be invoked than the principle underpinning such a charge.

A range of approaches exist – indeed almost as many approaches as organizations having to deal with overdue accounts. This is because private firms work out their policies consistent with their various business objective and government agencies work out their policies consistent with range of business, financial and social objectives depending on the nature of the nature of the agency, the services and government policy.

In Western Australia, local governments (e.g Cambridge, Fremantle) charge interest on overdue accounts. The currently published rate is a 10% rate of interest. Local government water retailers also generally have the right and do charge interest on overdue accounts. For example, Brighton in Tasmania, Gosford in NSW currently charge a 12%.rate of interest. Logan Council in Queensland charges 11%.

Sydney Water has the right to charge interest on overdue accounts and has listed a rate of 10% per annum for 2008/09. However, as outlined below it does appear to invoke this charge for small residential customers.

A case can be made that the current rate is higher than rates used by comparable agencies. However, as with all businesses the setting of the rate is a commercial issue.

Arguably, more important is the way that customers facing financial hardship are dealt with. Most utilities have financial hardship policies that allow them to manage those customers, usually residential, experiencing financial hardships. These policies will usually deal with all aspects of payments – installments, late payment fees, interest on overdue accounts, and will encompass situations where these charges can be waived/modified in the interests of securing an effective outcome. The Water Corporation has a hardship policy and deals with hardships customers within this policy. The Corporation participates in Hardship Utility Grant Scheme. [i]

Even where a rate can be charged it is not necessarily charged. Sydney Water in its 2007 submission to IPART noted that "…bills to residential customers and small commercial customers that habitually pay from one to 20 days late, the amount of interest accrued is too small to provide any significant incentive and would simply generate phone calls to Sydney Water. Therefore Sydney Water applies a $1.00 threshold for interest, meaning that it is generally only medium and large commercial customers that incur interest payments".[ii]

Farmland Pricing

Farmland pricing is based on a uniform charge is of $1.083 per kL. This charge is made for all farmer users accessing the farmlands system including: metro farmland, non metro farmland , local government standpipes and stock watering.

Farmland water was originally designed as water of last resort – it drought proofed the relevant farmland areas. As such it was never intended as a potable

water supply. Farmers were intended to make on farm water arrangements and use the standpipes only in an emergency.

The farmland water is supplied predominantly through two water supply schemes: the Goldfields & Agricultural Water supply Scheme (GAWS) sourced from Mundaring Weir and the Great Southern Towns Water Supply Scheme (GSTWS) sourced from Harris Dam. There are a number of smaller independent systems based on local supplies.

Farmland water is treated at source but distance transported and time in the system means that it is not recommended for potable use. Users who wish to use it for potable use need to undertake further treatment at the point of receipt.

There are two pricing issues –cost reflectivity and equity (encompassing uniformity).

For the metropolitan farms, the use of farmland water prices recognizes that some farms within the metropolitan area are supplied with water from the farmlands water system. For example some hills farms are supplied from the Goldfields pipeline. In this case they are charged the farmland price because they are being supplied from the same system as are other farms paying farmland price. The local government standpipes are connected to the farmland water supply system. Hence they are priced at the standard farmland price. Local Government accesses the water for a range of uses that involve users accessing water from the stand pipe (e.g farmers not connected to the system supplementing dam water, fire services etc). The local government makes a small admin charge on top of the standard price. Water from the standpipes is not delivered to properties with connection to the system. Again charging the same price for essentially the same water service is appropriate. The same logic applies to stock watering with farmland water supplies

The current uniform price is primarily based on equity considerations. It is not cost reflective pricing, either in terms of average cost or long run marginal cost of supplying this water to users in its various locations. Practicality has also influenced the pricing. Where local government standpipes are used there may a variety of end use customers and separate pricing to them would be impractical.

The major aspect of equity that has affected pricing relates to the original objective for this water which was last resort drought assistance. It was not intended to be a regular water supply for famers and other users and as a consequence governments have supported pricing at a reduced rate.

However, the water does have an opportunity value. In particular, for the G&WS, other customers (residential and non residential) exist who derive supplies from the system or who can use the source water that is delivered into the system. For example source water from Mundaring Weir into GAWS could be delivered to a range of consumers from GAWS or diverted to alternative non GAWS uses.

Applying the opportunity cost approach, and recognizing the non potable nature of the water, a price based on the non metropolitan non residential water price could be used. The application of the non residential country water tariff would likely result in price increases for farmland water . If the price was deemed, for equity reasons, to be too high then a specific CSO would need to be paid.

On uniformity, this is no different from other uniform pricing policies. The farmland water system covers a vast area and many regions and localities. As with country water pricing generally, there is no particular merit in uniformity. Efficiency would suggest that farmland water prices reflect the non residential water prices in the relevant area.

Small mining customers pay $1.889 per kL.

Most mines, and all large mines, are done in this way. However, there are a number of small mines (3-5 kL/day or less) where individual negotiation is not undertaken. For these a constant usage price of $1.889 kL is used.

This is a residual price structure. In general, mines are subject to individual price negotiations and individual supply contracts. The broad policy here is reasonable. Essentially a trade off has to be made between the transaction costs of individual contracts against the revenue gains. It would be expected that, for small mine volumes, separate contract negotiation would not be worthwhile. The volume at which this occurs is obviously a commercial decision. .

Whilst the policy of pricing simplification is reasonable, it is clearly the case that charge of $1.889 per kL is not based on an analysis of supply costs – it is not cost reflective. Moreover given the variety of mines and locations a uniform price is not warranted.

As with farmland pricing an appropriate pricing strategy would be to adopt the relevant tiered non residential country consumption price schedule.

Wyndham Sewerage Treatment

In Wyndham householders having septic holding tank are also connected to the sewerage system. As such they pay for a sewerage service and a private tank cleaning service.

Not all houses are in this position. Wyndham is deep sewered and new houses are connected directly to the sewerage system. It appears that under a previous policy, holding tanks were required to prevent solids from entering the sewerage system. Householders who have such tanks on their properties are responsible for their maintenance.

These households receive a sewerage service whereby waste water is removed via the septic holding tank, and transported to treatment ponds located on the Cambridge Gulf mud flats. A three stage process is used whereby treated water is recycled back to the town's open space.

Periodically, during heavy wet season rains, the water from the third stage pond is released into the Gulf to prevent damage to the [pond structure.

Forecasting and Demand Risk

The Water Corporation has two forecasting needs. It must forecast water demand as part of its revenue forecasting. It must also forecast lot production as part of its infrastructure planning.

Planning for infrastructure and planning for revenue are distinct activities with distinct forecasting methodologies and models.

Both approaches focus on producing 4 year rolling forecasts. Four years is the important time frame for Treasury. Accurate forecasts are needed over this period to allow planning for revenue and dividend growth and for planning infrastructure expenditure.

Beyond 4 years, forecasts are less important and are based on long run trend variables. For lots this is essentially projected population growth and household formation which in turn is largely based on historical growth rates.

Planning/forecasting for infrastructure

Up to 4 years- Metropolitan Region

Infrastructure planning is essentially a matter of forecasting lot development. There is no formal model for these forecasts. Data from many third party sources (DPI, UDIA, Bis-Shrapnel, LandCorp, Treasury, Consultants) is combined to develop a best estimate of the likely number and location of new lot development over the next fours years.

The key to understanding likely lot development is developer intentions. Intentions data are collected by DPI and UDIA.

These intentions must however be considered within the wider economics context including government policies (e.g. first home schemes) and interest rate policies. Water Corporation monitors these developer intentions, matches them in a non formal way with the various 3rd party forecasts and "checks" its assessments by remaining in close contact with the major developers.

This is a relatively easy approach to operate. Land developers have a vested interest in keeping the Water Corporation informed about the scale and timing of their land developments because they need Water Corporation services and infrastructure to be available for their land developments. It is also a sensible approach. Within this forecasting timeframe, land developers will be continuously assessing their developments. Some will be brought forward, some will go back in time. The Water Corporation needs to react accordingly in terms of infrastructure. Hence it needs to be well aligned with developer intentions and needs to be able to adjust in real time as developers adjust.

Beyond four years- Metropolitan Region

The forecasts are rolling forecasts, so the reference here is to year 5 and beyond when taken from a given year. Lot numbers are projected based on a simple extrapolation of the historical growth rate in population.

Up to 4 years – Non Metropolitan Regions

The same approach is used for non metropolitan regions. However in most non metropolitan centres LandCorp is the main land developer – over 90% of land development in many cases. Essentially therefore non metropolitan infrastructure planning/forecasting is largely a matter of remaining close to what LandCorp is planning over the period. Again as a dominant land developer LandCorp has an incentive to dialogue with the Water Corporation regarding its proposed and projected land developments.

Beyond 4 years – Non Metropolitan Regions

The forecasts are rolling forecasts, so the reference here is to year 5 and beyond when taken from a given year. Lot numbers are projected based on a simple extrapolation of the historical growth rate in population. Agencies such as DPI provide such information but with regional centres, new projects can have significant impacts and working closely with local government and LandCorp can provide early warning.

Planning/forecasting for water demand and revenue

This can be divided into wastewater and drainage and water consumption. For waste water and drainage, net new lot numbers is the key driver. Lot numbers are forecast as outlined above for infrastructure planning. This is enough for this task as the bulk of revenue in any forecast period comes from the existing stock of lots. The Corporation argues that it has excellent information on wastewater and drainage for existing lots by type and location.

For water demand a more complex water consumption model is used by the Water Corporation.

The broad parameters of this model are as follows:

- Actual water consumption (aggregate and per capita) is used to estimate a ten year average annual rate of growth by tariff category and location/system.

- A ten year period is used to account for wet/dry cycles – on the assumption that the ten year period accounts for the pattern of natural variability.

- The ten year average growth rate is then used to project growth for the forecast period with adjustments for

- Increased number of lots with lots assigned average water consumption for lot size ands type.

- Targets for water efficiency for existing and new lots based on dwelling type, garden type and water wise initiatives.

- Any other specific initiatives, such as sewer mining and recycling that might push projected demand up or down compared to base forecasts.

The lot number forecasts are based on the approach outlined previously. Water efficiency information is provided primarily from the work of the water efficiency branch inside the Water Corporation. This group develops specific initiatives to encourage water savings and monitors external developments that will impact on water efficiency such as water wise land developments. Its assessments are used to adjust the demand projections based on trends.

These methodologies are broadly in line with methodologies used elsewhere and recommended for water demand forecasting elsewhere.[iii] The role of price in assessing demand over the forecast period is minimal although given the relative price insensitivity of demand, this is not likely to be significant in terms of accuracy. [iv]

Typically these forecast are within 2% of actual for water demand and within 1% of actual for drainage and wastewater.

There is a question as to what should happen when actual water sales deviate from the forecasts on which regulated prices are set. Two possibilities exist.

1. Whenever water sales exceed forecasts actual revenue will exceed allowed revenue – in effect average water price was set too high.

2. Whenever water sales fall short of forecasts actual revenue falls below allowed revenue – in effect average water price was set too low.

Over the long run, which can cover multiple regulatory periods, average water price needs to allow operating and capital costs to be covered including the allowed return of and on capital. Consistent with incentive based or price cap regulation, price changes need to be consistent with assessed productivity improvements.

This provides a way of thinking about forecast sales that deviate from actual sales within the regulatory period.

As a starting point, demand forecast deviations could be treated in the same way we would treat deviations from assessed productivity.

Typically, under price cap regulation a price path is agreed for a regulatory period that allows for an annual productivity improvement. If a regulated utility does better/worse than this it will to its benefit/cost within the period. Subsequent price determinations can take this into account so that in the long run, ceteris paribus, price moves in line with productivity improvements. There is incentive on both sides to be as accurate as possible with the productivity estimates that underpin prices.

The same approach could be adopted with respect to demand projections. The price path is fixed for the regulatory period based on:

Projected sales/revenues

Projected costs/productivity.

As with productivity outcomes, a divergence between actual demand and agreed demand forecasts used as the basis for setting prices over the regulatory period could be adjusted for in the subsequent regulatory period.

Just as with the costs/productivity there is an incentive for parties to make the demand forecasts as robust as possible. There is also an opportunity to improve the accuracy of forecasts over regulatory periods. The more accurate the forecasts, the less the shortfall/surplus relative to allowed revenue and the smaller the subsequent adjustment required. The Water Corporation demand forecasts currently appear to be within 2% for water sales and 1% for wastewater and drainage sales, although as noted below, this equates to a significant amount of revenue.

Under this system the Water Corporation bears some risk during the regulatory period but in the long run is able to cover efficient operating and capital costs (including return on and of capital). Customers pay the correct average price over time but relative to demand, may do better/worse over a single regulatory period as per points 1) and 2) above.

A key question that needs to be answered is whether the annual demand forecasts looking ahead 3 to 5 years are accurate enough to make this approach workable.

A variety of issues are relevant here but two stand out. First climate change and rainfall variability and second water efficiency.

Rainfall variability impacts on water demand. For example, late spring rains will reduce water demand. In addition, future rainfall variability must now considered within the context of climate change which impacts both upon trend and variability of rainfall patterns.

Partly as a response to climate change, the Water Corporation and the State Government are committed to improving water efficiency.

Promoting water efficiency could be regarded as inconsistent with the primary commercial objective to sell water at commercially viable prices.

Neither of these is an argument against adopting a three year cycle with retrospective adjustments if they can be forecast with sufficient accuracy. My understanding, as set out above, is that the demand forecasting undertaken by the Corporation is sophisticated enough in structure to account for climate change and rainfall variability and for the water consumption impacts of water efficiency initiatives. And certainly detailed enough to project lot developments.

However, whether the stated accuracy of the forecasts is sufficient to move away from annul price reviews to three year reviews where the Water Corporation bears demand risk is another matter. Error bands of +/- 2% on water sales as reported above would represent significant revenue and would potentially result in costs not being covered in some years. In this memo the consequences of such errors are not able to be estimated, but arguably a full documentation of what such errors might mean is desirable as part of any move to three year reviews. This would require a detailed assessment of the Water Corporation forecasts and a determination of the "acceptable level of accuracy" for moving to a three year review.

Beyond the issue of forecast accuracy there are two other issues that need consideration.

Within a three year price review there will be impacts upon demand that potentially require one off adjustments. State Government initiated changes to water restrictions may fall into this category.

There may also be specific parts of the business (tariff sectors) that are not amenable to the application of the price setting model as suggested because they are dominated by large projects which can change their operational configuration within the three year period (e.g mining). Some regional markets may fit into this category where single projects change the demand significantly. Such projects may not be known about at the start of the three year cycle or can be expedited by the developer. Similarly projects can be cancelled or delayed.

In its 2007 submission to the IPART review of its prices, Sydney Water argued that it had reached the point where metred sales forecasts (and cost projections) were sufficiently accurate to move away from annual price reviews to 4 yearly reviews based on setting fixed price caps. It was recognized that any determination could be opened for substantial changes to costs or demand. The change would result in demand and expenditure being treated similarly.[v] However, Sydney Water does not encompass the sorts of sectors (mining, regional markets) that the Water

Corporation does. It deals essentially with metropolitan residential and non residential metred sales which arguably are easier to forecast.

Arguably, even if Water Corporation was to bear demand risk, this approach could only be applied to those markets where the demand forecasts could be made with a sufficiently high degree of accuracy. Even where this is potentially the case, as it could be for metropolitan area , metred sales, there may still be uncertainties regarding policy settings. For example a decision to introduce tighter water restrictions within a regulatory period would have significant revenue consequences that are not easily foreseeable.

It is worth noting that there appear to be some inconsistencies in submissions on this point. It can be argued that the recommendation to have fixed price caps (indexed for inflation) for three years implies that over the three year period, the regulated firm bears some risk on both the revenue an cost/productivity side. This is a straightforward reading of incentive based regulation. Yet in some submissions the former was supported but the latter opposed.

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[i] WACOSS (2009) WACOSS Response to the Economic Regulation Authority Draft Report Inquiry into Tariffs of the Water Corporation, Aqwest and Busselton Water

[ii] Sydney Water. (2007). Submission to the Independent Pricing and Regulatory Tribunal Review of Prices for Sydney Water Corporation. Appendix G, p4.

[iii] Essential Services Commission (2004). Discussion Paper Economic Regulation of the Victorian Water Sector Demand Forecasting.

[iv] Essential Sevices Commission (2008). Melbourne Metropolitan Water Price Review 2008-2009 references price elasticities of 0, -0.1 and -0.14 to -0.21 for tier1,2,3 residential water demand.

[v] Sydney Water. (2007). Submission to the Independent Pricing and Regulatory Tribunal Review of Prices for Sydney Water Corporation. P53.