Recycled Water Prices for Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council

Issues Paper

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
of New South Wales

Recycled Water Prices for Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council

Issues Paper

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Request for submissions

Submissions are invited from interested parties. Unless confidentiality is sought, the submissions are generally available for public inspection at the Tribunal's offices and will be available on-line in PDF format from the time of processing of the submission until 3-4 weeks after the release of the final report of an inquiry. The Tribunal may exercise its discretion not to exhibit any submissions based on their length or content (containing material that is defamatory, offensive, or in breach of any law).

Submissions must be made in writing and should be sent to the postal address, fax number or email address below. Where possible, submissions should be provided in a computer readable format (eg, word processor, PDF or spreadsheet) either on disk or by email.

Submissions from the water agencies must be received by 10 March 2006. Submissions from other stakeholders must be received by 24 March 2006.

All submissions should be sent to: **Recycled Water Price Review**
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB Post Office NSW 1230

Confidentiality

If you want your submission, or any part of it, to be treated as confidential, please indicate this clearly. The Tribunal may include in its publications a list of submissions received during the course of a particular review or inquiry. It may also refer to submissions in the text of its publications. If you do not want your submission or any part of it to be used in any one of these ways, please indicate this clearly.

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Privacy

All submissions will be treated in accordance with the *Privacy and Personal Information Act 1998*. Any personal information you give us will not be reused for another purpose.

Public information about the Tribunal's activities

Information about the role and current activities of the Tribunal, including copies of latest reports and submissions can be found on the Tribunal's web site at www.ipart.nsw.gov.au.

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1 INTRODUCTION

The Independent Pricing and Regulatory Tribunal of NSW (the Tribunal) is currently conducting a review of prices for recycled water services provided by the four metropolitan retail water agencies in NSW – Sydney Water Corporation (Sydney Water), Hunter Water Corporation (Hunter Water), Gosford City Council (Gosford Council) and Wyong Shire Council (Wyong Council). As part of this review, it is also considering pricing arrangements for sewer mining.

1.1 Objectives of the review

The key objectives of the review are to:

- make determinations for Sydney Water, Hunter Water, Gosford Council and Wyong Council that establish a consistent and transparent approach for efficient pricing of recycled water for non-potable residential, commercial, agricultural and environmental flow purposes
- consider making a determination for sewer mining in the sewerage systems operated by Sydney Water, Hunter Water, Gosford Council and Wyong Council.

At the conclusion of the review, the Tribunal expects to make determinations for each agency that achieve the most efficient, effective and sustainable pricing arrangements for recycled water services and sewer mining.

1.2 Why is the Tribunal conducting this review?

To date, the Tribunal has only been involved in setting prices for recycled water services provided in the Rouse Hill Development Area (a relatively small residential area in western Sydney). Outside Rouse Hill, there are currently only a small number of existing customers for recycled water, and these customers have been able to negotiate prices directly with their service provider.

However, this situation is expected to change in the near future. In response to concerns about the long-term sustainability of water supplies, the NSW Government and the four water agencies are planning and implementing approaches aimed at balancing water demand and supply as populations grow. One approach is increasing the use of recycled water to replace potable water for some purposes. A range of initiatives is being implemented that will encourage greater use of recycled water, including:

- The Building and Sustainability Index (BASIX), which currently requires reductions in average water use in new houses and multi-unit dwellings built in NSW, and will be extended to apply to renovations after July 2006.
- The Metropolitan Water Plan for Sydney, which includes a recycled water strategy that aims to maximise the use of recycled water to replace potable water where feasible. This strategy identifies projects that will use recycled water for a range of purposes, including residential (non-drinking) purposes.
- Initiatives aimed at increasing private sector involvement in developing innovative solutions to Sydney's water supply/demand imbalance, and particularly in providing recycled water services.

These and other initiatives, which are discussed in more detail in Appendix 1, mean that there is likely to be growth in large-scale recycled water schemes in the coming years, including schemes for residential developments. This will lead to a greater number of recycled water customers, many of whom will be obliged to connect to recycled water schemes for some uses of water.

The Tribunal recognises that not all potential users of recycled water services have equal bargaining power. Large commercial and industrial users are likely to be in a better position to negotiate suitable commercial arrangements with the metropolitan water agencies than residential users living in areas where the use of recycled water for certain activities will be mandated. Where the water agencies and large users are able to negotiate mutually agreeable business arrangements, the Tribunal may decide to continue its light-handed approach to pricing for these customers.

To date, only limited sewer mining has taken place in NSW. However, initiatives to encourage private sector participation in the water industry are likely to see an increase in sewer mining projects. In its 2003 metropolitan water price determination,[1] the Tribunal set the maximum price for taking sewage at zero. However, where sewer mining results in avoided costs for the metropolitan water agencies a zero sewer mining charge may not always achieve efficient outcomes.

For these reasons, the Tribunal believes it is important that consideration now be given to the pricing of recycled water and sewer mining in the operating areas of Sydney Water, Hunter Water and Gosford and Wyong councils, with a view to establishing robust, consistent pricing arrangements.

1.3 What will the review cover?

The review will cover prices for recycled water services provided by Sydney Water, Hunter Water, Gosford Council and Wyong Council under section 11 of the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act).[2] The review will also consider pricing arrangements for sewer mining in the sewerage systems operated by Sydney Water, Hunter Water and Gosford and Wyong Councils.

1.3.1 Recycled water

For the purpose of this review, recycled water is defined as *highly treated effluent made available for beneficial (non-potable) uses*. In general, the process used to turn effluent into recycled water involves tertiary treatment at a centralised treatment plant and, in some cases, further treatment at customers' premises so that it is fit for its intended purpose. Uses of recycled water can include:

- residential uses other than drinking or personal use, such as flushing toilets, laundry use, washing cars and watering gardens

1 IPART, *Sydney Water Corporation – Prices of Water Supply, Wastewater and Stormwater Services from 1 July 2003 to 30 June 2005*, May 2003.

2 Section 11 gives the Tribunal a standing (ongoing) power to investigate, and report to the Minister (Premier) on the determination of the pricing for a government monopoly service that is supplied by a government agency specified in Schedule 1 of the IPART Act.

- commercial and industrial uses, for example as an input to industrial processes, for irrigating golf courses and urban parks and landscapes, and for flushing toilets in commercial buildings
- agricultural uses, such as irrigating crops and pastures
- releasing it into rivers to maintain or improve environmental flows, in place of releases from dams.[3]

Although recycled water is used to a very limited extent in some countries for drinking or personal use, the Tribunal will not consider the price of water for this purpose as part of this review.[4] Nor will it consider localised on-site recycling, domestic grey water reuse or stormwater harvesting.

Localised on-site recycling and domestic grey water reuse usually involve the property owners undertaking these activities themselves. Under these arrangements, users bear the costs directly and reap the benefits directly. They are generally not services that involve one of the four metropolitan water agencies that are the subject of this review. This is also the case for small-scale stormwater recycling using rainwater tanks.

Large-scale stormwater harvesting would involve similar treatment processes to recycled water and may have some of the same benefits. However, stormwater harvesting would require large storages to capture and hold the water until needed. In addition, there are several factors that complicate stormwater price regulation, including:

- Arrangements for the management of stormwater in NSW are fragmented. Local government agencies play a dominant role in the collection, transportation and management of stormwater, with Sydney Water and Hunter Water managing only the very large stormwater channels. The Tribunal does not have the power to regulate the prices local government generally[5] might charge for harvested stormwater.
- The legal rights of parties to take, treat, store and sell stormwater are not clearly developed.

In view of this, the Tribunal will not consider the price of water sourced in this way as part of the current review of recycled water prices.

1.3.2 Sewer mining

The Tribunal will consider making a determination for sewer mining in the sewerage systems of the four water agencies as part of this review. Sewer mining is defined as *the extraction of raw sewage from a point in the sewerage network upstream of a sewage treatment plant (STP), for treatment and recycling by a party other than the operator of that network*. In order to sewer mine, third parties need to connect to the sewerage system after negotiating the terms and conditions of connection and effluent extraction with the relevant water agency. Sewer miners do not have a direct relationship with sewerage customers.

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3 The uses of recycled water are discussed in more detail in Appendix 3.

4 The NSW Government has announced that it does not currently favour using recycled water for drinking water, either directly or indirectly (eg, by pumping it into Warragamba Dam).

5 With the exception of Gosford City Council and Wyong Shire Council.

When reviewing arrangements for sewer mining, the Tribunal will consider the relative bargaining power of water agencies and potential sewer miners. The Tribunal will need to be satisfied that making a determination for sewer mining will not stifle market operation and that it will result in prices that are more efficient.

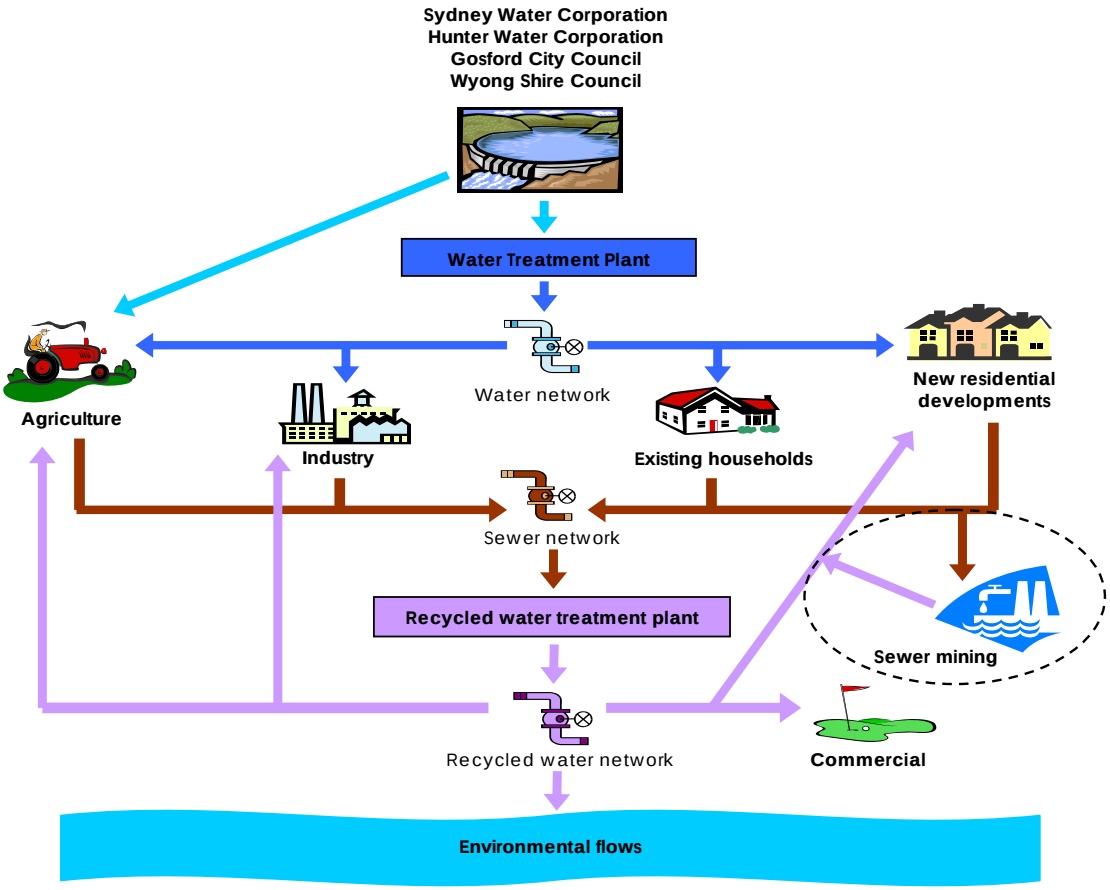
1.3.3 The review will not cover private sector service providers

This review will not establish a third party access regime, nor will it address recycled water provided by the private sector under any third party access regime. Third party access is distinct from sewer mining in that under an access regime, the contract is between the third party and the customer, whereas for sewer mining, the contract is between the sewer miner and the water agency involved.[6]

The Tribunal does not have power under the IPART Act to set a price for recycled water if that water is supplied by a private sector provider. Therefore, the review will only address pricing arrangements for the four metropolitan water agencies for recycled water and sewer mining. However, the Tribunal's determination may inform price negotiations between private sector providers and their potential customers. The Tribunal's pricing powers could be expanded to cover third party providers if the NSW Government deemed this appropriate.

The agencies covered by this review and potential uses of recycled water are illustrated in Figure 1.1 below.

Figure 1.1 Water agencies and potential uses of recycled water included in the review



6 For more information about third party access regimes see Appendix 2.

1.4 Conduct of the review

The Tribunal's overall approach will be to identify a range of options for recycled water pricing then evaluate these options against objectives established during the review to determine the most appropriate pricing arrangements for recycled water and sewer mining.

In conducting the review, the Tribunal will undertake public consultation as well as its own research and analysis. As part of this consultation, the Tribunal invites the four water agencies and other interested parties, including members of the public, to make submissions to the review and present their views on the issues raised in this paper. Details on how to make submissions are provided at the front of this paper. The Tribunal will also hold a public hearing as part of the review to provide a further opportunity for stakeholders to present their views.

Once it has considered the matters raised during this consultation, the Tribunal will release a draft report, and invite stakeholders to comment on its draft findings. The Tribunal will then consider these comments before making its final determination and releasing its final report. An indicative timetable for the review is provided below.

Table 1.1 Indicative review timetable

Task	Timeframe*
Release issues paper	10 February 2006
Receive submissions from water agencies	10 March 2006
Receive public submissions	24 March 2006
Public hearing	31 March 2006
Release draft report	15 May 2006
Receive submissions to the draft report	2 June 2006
Release final report	21 July 2006

* Please note that these dates are indicative and may be subject to change.

In making its determination, the Tribunal will be guided by the IPART Act. Under this Act, the Tribunal is required, in setting prices for services provided by Government monopoly water suppliers, to consider a broad range of issues, including social, environmental and agency-specific concerns. In particular, section 15 of the Act requires the Tribunal to consider matters related to:

- **consumer protection** – protecting consumers from abuses of monopoly power; standards of quality, reliability and safety of the services concerned; social impact of decisions; effect on inflation
- **economic efficiency** – greater efficiency in the supply of services; the need to promote competition; effect of functions being carried out by another body
- **financial viability** – rate of return on public sector assets including dividend requirements; impact on pricing of borrowing, capital and dividend requirements of agencies

- **environmental protection** – promotion of ecologically sustainable development via appropriate pricing policies; consideration of demand management and least-cost planning.

In addition, the Tribunal will have regard to the requirements of the National Water Initiative (NWI) endorsed by the Council of Australian Governments and to the earlier Water Reform Framework (see Appendix 1).

1.5 Purpose and structure of this paper

The purpose of this issues paper is to help water agencies and interested parties prepare submissions to the review. It provides background information and raises issues that the Tribunal considers relevant for determining prices for recycled water services. While it would like the agencies and other stakeholders to address these issues in their submissions, the Tribunal also welcomes submissions on other matters that interested parties believe should be addressed.

The paper is structured as follows:

- Chapter 2 describes the water supply and policy context within which the review is taking place. This includes discussion of the industry structure as well as government and water agency programs that are driving increases in recycled water demand and supply.
- Chapter 3 summarises the current approaches to recycled water pricing in NSW and other jurisdictions.
- Chapter 4 outlines some of the key factors that need to be considered when setting recycled water prices, and seeks stakeholder views on these.
- Chapter 5 sets out some of the options for pricing arrangements for recycled water and sewer mining, and seeks stakeholder input on these and other options that may be considered.
- Chapter 6 identifies some broad criteria against which the various pricing options could be evaluated and seeks stakeholder input on these criteria.

2 INDUSTRY AND REGULATORY CONTEXT

As set out in Chapter 1, the Tribunal's review covers the four metropolitan retail water agencies in NSW – Sydney Water, Hunter Water, Gosford Council and Wyong Council. This chapter provides an overview of the recycled water services each agency provides, the regulation of these services, and the Tribunal's powers to determine the prices the agencies charge for these services.

2.1 The agencies and their current recycled water services

The four agencies covered by this review are responsible for providing water, sewerage and some drainage services to almost 5 million people. They service a region that stretches from south of Wollongong to north of Newcastle (see Figure 2.1).[7]

Figure 2.1 Approximate area of retail water supply for Sydney Water, Hunter Water, Gosford Council and Wyong Council

While recycled water provision is still in its infancy in NSW, all four water agencies have projects in place or at the planning stage.

7 For more information on the functions of the water agencies, refer to IPART, *Review of Metropolitan Water Agency Prices Issues Paper*, July 2004. www.ipart.nsw.gov.au/files/DP75.pdf

2.1.1 Sydney Water

Sydney Water currently operates 14 recycled water schemes, recycling 15,000 megalitres of effluent per year, or 2.8 per cent of the total effluent it discharges. The volume of water it recycles will increase by an extra 15,000 megalitres when additional schemes come on-line in the next few years. These include:

- a scheme to supply Bluescope Steel with 20 megalitres per day of recycled water
- the extension of residential schemes at Hoxton Park and Rouse Hill (stage 3)
- schemes at North Head and Malabar Sewage Treatment Plants and
- the West Camden agricultural scheme.[8]

2.1.2 Hunter Water

Hunter Water recycles approximately 4,200 megalitres of effluent, or 8.5 per cent of dry weather flows each year.[9] Most of this is used for industrial purposes and irrigation. Hunter Water's Integrated Water Resource Plan (IWRP)[10] contains a target of 17 per cent recycled water by 2007. At least one new residential development is proposed that will have both reticulated drinking water and reticulated recycled water.

2.1.3 Gosford Council

Gosford Council recycles 150 megalitres of effluent each year on-site at its sewage treatment works. It is currently conducting a study to assess the feasibility of various recycled water projects. While no residential schemes are currently proposed in Gosford, Council has applied for funding under the National Water Initiative for a large recycled water pipeline to service industrial and irrigation customers. It is estimated that this will replace 4,000 megalitres of potable water per year by 2015. Construction of the scheme is proposed to commence in 2007 if funding is available.[11]

2.1.4 Wyong Council

In 2005, Wyong Council provided around 430 megalitres of tertiary treated recycled water to customers. It has two large recycled water customers, both of which are golf courses. Tertiary treatment facilities at other treatment plants will come on line in 2006 to service new recycled water customers. Council also uses a small volume of lower quality recycled water on its own sites.[12]

8 Information provided to IPART by Sydney Water Corporation.
9 Based on data provided by Hunter Water Corporation for the 2004/05 financial year.
10 Hunter Water Corporation, *Integrated Water Resource Plan,* March 2003. (www.hunterwater.com.au)
11 Information provided to IPART by Gosford Council.
12 Information provided to IPART by Wyong Council.

2.2 Regulation of recycled water

The metropolitan water agencies are monopoly service providers owned by either the NSW Government or local government. These agencies are regulated to protect public health and the environment and to ensure that they do not abuse their monopoly positions. Sydney Water and Hunter Water are governed by their own Acts and their operating licences. Gosford and Wyong Councils are subject to requirements in the *Local Government Act 1993* and the *Water Management Act 2000*.

The Tribunal is responsible for setting maximum prices that can be charged by the metropolitan water agencies for all monopoly services. In the case of Sydney Water and Hunter Water, it is also responsible for monitoring and reporting on their compliance with their operating licences.

As noted in Chapter 1, to date the Tribunal has chosen not to determine maximum prices for recycled water services, except for those provided in the Rouse Hill Development area. Its approach to pricing recycled water in Rouse Hill is discussed in section 3.2.1. The Tribunal's approach to setting the price the agencies can charge third parties for mining sewage is discussed in section 3.2.2.

Several other NSW government agencies have primary responsibility for regulating the agencies to protect public health and the environment:

- **Department of Natural Resources (DNR)** has primary responsibility for the management and ownership of water resources throughout NSW. DNR issues Water Management Licences to water authorities, which regulate water extractions, environmental flow requirements in natural waterways and other resource management issues.
- **Department of Environment and Conservation (DEC)** is responsible for licensing sewage treatment facilities and ensuring that effluent discharges do not harm receiving waters. In the event of an increase in recycled water supply, DEC would oversee the management of waste disposal from both Government and private sector providers. DEC would also manage Environmental Impact Statements and associated approval processes for the implementation of recycled water schemes. Depending on the nature and scale of impacts, recycling projects will need to comply with a range of environmental planning approvals, State Environmental Planning Policies (SEPPS), and other environmental protection and planning legislation.
- **NSW Health** regulates to ensure public health outcomes. This includes monitoring and regulating the safety and quality of potable water provided to customers. NSW Health has also issued Guidelines relating to the safe use of recycled water for various purposes (eg, urban/residential use, and more recently agricultural/irrigation use). These establish the uses and quality measures for the re-use of secondary treated effluent for various purposes, including industrial uses, pasture, crop and forest irrigation, municipal landscape irrigation, and groundwater recharge.

2.3 The Tribunal's power to determine recycled water prices

Section 11 of the IPART Act provides power to the Tribunal to determine the price of "government monopoly services" as defined by the IPART Act.[13] Section 4 of the IPART Act defines a government monopoly service as a service that is:

- supplied by a government agency and
- declared by the regulations or the Minister to be a "government monopoly service".

The relevant declaration in force is the *Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997* (Pricing Order). The services declared in the Pricing Order that are relevant to the Tribunal's review of recycled water prices are:

- water supply services
- services that are "supplied in connection" to water services
- services that "relate to" or are "ancillary to" water supply services.

Neither the IPART Act nor the Pricing Order provides a specific definition of "water supply service" nor refers to "recycled water". The Act simply defines a "service" as including the supply of water, electricity, gas or other thing (whether or not of the same kind).

The Act does not specify that the water supplied must be of drinking water quality to constitute a "water supply service" over which the Tribunal can exercise jurisdiction. A plain English understanding of a "water supply service" would encompass a water supply that includes recycled water. On this interpretation, the Tribunal has the power to determine the price of recycled water supplied by Sydney Water, Hunter Water and the Gosford and Wyong Councils.

However, the Tribunal does not have power under the IPART Act to set a price for recycled water if that water is supplied by a private sector provider that is acting in its own right (as opposed to merely acting as an agent of a public sector provider). If it were deemed appropriate for the Tribunal to regulate prices for private sector providers in the future, the NSW Government would need to amend existing legislation or create new legislation or other regulatory instruments to facilitate this.

[13] The Tribunal may set maximum prices or may determine a methodology for setting maximum prices.

3 CURRENT APPROACHES TO PRICING WATER SERVICES

As part of its review, the Tribunal will take into account the approach it currently uses to price non-recycled water services provided by the four metropolitan water agencies, as well as the current approaches to pricing recycled water services and sewer mining in NSW and in other jurisdictions. These approaches are outlined below.

3.1 Pricing of non-recycled water services

The Tribunal currently sets prices for the major metropolitan water agencies to recover the efficient costs of providing water, sewerage and some stormwater services. These costs are recovered through a combination of periodic charges and developer charges.

3.1.1 Periodic customer charges

Periodic customer charges are the recurrent charges water agencies levy on their customers for water, sewerage and stormwater services. The Tribunal sets these prices for each agency so that they generate sufficient revenue to ensure that the agency can operate its business efficiently, maintain an appropriate level of investment in its assets, provide appropriate levels of customer service, and meet all the required environmental, public health and other standards.

The Tribunal's price setting process involves determining the revenue requirement of each water agency, based on an analysis of the efficient operating and capital costs it should incur to provide appropriate levels of service to its customers. Prices are then set to generate this level of revenue. The price setting process also includes a backward-looking test of the prudence of past capital expenditure. If the agency's expenditure is not deemed prudent, it is not allowed to earn a return on it in the future. This approach ensures that the water agencies operate efficiently and do not exercise their monopoly powers to extract excess revenues from customers.

The Tribunal has generally retained uniform or 'postage stamp' pricing for periodic charges within each agency's area of operations. This means that all customers within each customer class are charged the same price for a service, even though there are variations in the cost of service delivery across the supply network.[14]

The Tribunal also sets the length of the determination period for which periodic charges apply. To date, it has generally opted for a four or five-year period, but it has decided on shorter periods when the regulated industry is undergoing change or there is uncertainty within the industry or the business.

[14] In 2000, the Tribunal accepted a proposal from Hunter Water Corporation to provide a small and variable discount to very large customers on water use above 50,000kL per annum, which reflected locational variation in the extent of delivery assets used by these customers. [IPART, *Sydney Water Corporation – Prices of Water Supply, Wastewater and Stormwater Services from 1 July 2000.* September 2000]

3.1.2 Up-front developer charges

Developer charges are the up-front charges levied by the water agencies on property-owners in new developments when they connect to the water or sewerage system. These charges are levied on a per-lot basis to recover part of the costs incurred by the water agency in providing the infrastructure required for water services in these new developments.

In determining developer charges, the Tribunal established a methodology based on net present value (NPV) principles, rather than setting individual charges. The water agencies use the methodology to calculate their own developer charges for new development areas. This enables them to recover the total costs of providing infrastructure for new developments through a combination developer charges and periodic water and sewerage charges.

The developer charges methodology allows differential charging to reflect the diversity of costs associated with providing infrastructure to different development areas. This approach provides signals for resource allocation and usage and ensures the financial viability of extensions of urban water infrastructure.

Developer charges are published by agencies in Development Servicing Plans (DSPs). These DSPs are publicly exhibited and then submitted to the Tribunal. Agencies are required to review the DSPs every five years, or as required by the Tribunal following a review of periodic charges.

3.2 Pricing of recycled water services and sewer mining in NSW

The pricing and regulatory framework for recycled water services is still in its infancy in NSW. To date, the Tribunal has had minimal involvement in setting prices for these services. It has only set prices for recycled water services provided in the Rouse Hill Development Area in Sydney. It also set a price for sewer mining in Sydney in its 2003 metropolitan water price determination. In addition, the Sydney Olympic Park Authority has separate pricing arrangements for recycled water it supplies to Sydney Olympic Park and the nearby suburb of Newington.

Outside of the Rouse Hill area, prices for recycled water have generally been set by the water agencies themselves. Most agencies in NSW set prices on a project-specific basis and often the approach is different for different customers. Research suggests that there is a similar diversity of approaches throughout Australia and overseas.

3.2.1 Rouse Hill Development Area

Each of the 15,000 customers in the Rouse Hill Development Area currently pays a fixed charge of $133.30 per year for the availability of both recycled water and drainage. This charge consists of $107.98 for stormwater and drainage services and a $25.32 recycled water access charge. In addition, Rouse Hill customers pay a recycled water usage charge of $0.293/kL (compared with $1.20/kL for potable water)[15].

15 IPART, *Prices of Water Supply, Wastewater and Stormwater Services, Determination Number 5, Sydney Water Corporation*. September 2005.

The Rouse Hill recycled water price structure, with its low usage charge, was developed to encourage the use of recycled water. Although potable water use in Rouse Hill is relatively low, *total* water consumption is around 20 per cent higher than the Sydney average.[16] During peak usage, recycled water supplies cannot always meet demand and have to be topped up with potable water. It has been suggested that the relatively low usage charge for recycled water has led to its overuse.

Sydney Water plans to expand the Rouse Hill recycled water scheme by an additional 21,000 lots. This will result in 4,600 megalitres of recycled water demand each year by 2028. As it is over 12 years since the Tribunal first established a price for recycled water at Rouse Hill, it is timely that pricing arrangements be reviewed.

The Tribunal seeks comments on the current pricing arrangement and price levels for recycled water at Rouse Hill.

3.2.2 Sewer mining

The Tribunal has the legal power to regulate the price that government-owned water agencies may charge third parties for mining sewage. In its 2003 metropolitan water price determination,[17] the Tribunal set the maximum price for taking sewage at zero. Sydney Water was required to provide access to the sewer for extractive purposes on the basis that it only recovered the incremental cost of making access to its sewers available. The Tribunal remained silent on this matter in its determinations of September 2005, pending this review of recycled water prices.

To date, limited sewer mining has taken place in NSW. A notable example of a sewer mining customer is the Sydney Olympic Park Authority (discussed below). However, sewer mining is likely to feature amongst future recycled water projects. In its report, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region,* the Tribunal noted that in some cases, sewer mining and recycled water schemes have the potential to lower sewage treatment and disposal costs for water agencies. Therefore, it may be appropriate to consider these avoided costs when establishing prices for sewer mining.[18]

3.2.3 Sydney Olympic Park Authority

The Sydney Olympic Park Authority (SOPA) provides recycled water to Sydney Olympic Park and the nearby suburb of Newington for all non-drinking purposes to residential properties, commercial premises, sporting venues and irrigation of parklands and playing fields.

About 75 per cent of SOPA's recycled water is sourced from local sewage (via sewer mining), with the remainder sourced from locally collected stormwater. There is no charge associated with the untreated sewage that SOPA extracts from Sydney Water's system.

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16 Australian Academy of Technological Sciences and Engineering, *Water Recycling in Australia,* 2004.

17 IPART, *Sydney Water Corporation – Prices of Water Supply, Wastewater and Stormwater Services from 1 July 2003 to 30 June 2005*, May 2003.

18 IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Final Report,* November 2005.

The scheme delivers around 850 megalitres of recycled water each year to over 1000 customers. This is proposed to increase to over 1000 megalitres per year in the next two years, through addition of further customers within Sydney Olympic Park.[19]

The recycled water is currently supplied to customers at 15 cents below Sydney's drinking water price. SOPA's recycled water charges do not recover the full financial costs incurred by SOPA in providing this service.

In its submission to the Tribunal's *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region* in 2005, SOPA noted that the approach taken to pricing the scheme is financially unsustainable because:

- although it treats and recycles sewage and stormwater from the area, SOPA cannot levy sewerage and stormwater charges for these services – other organisations (Sydney Water and local Councils) receive these payments
- there is no mechanism to ensure developers provide adequate capital contributions to fund ongoing growth of the scheme generated by their developments.

3.3 Pricing recycled water in other jurisdictions

A recent survey of major metropolitan water agencies in Australia undertaken by ACIL Tasman for the Water Services Association of Australia (WSAA)[20] found that regulators use a variety of approaches for setting prices for recycled water services, basing prices on:

- an analysis of the costs of providing the services (58 per cent)
- an assessment of customers' willingness to pay for the services (57 per cent)
- the price of substitutes (19 per cent)
- a proportion of the price potable water services (4 per cent).

The WSAA report also indicates that similarly diverse approaches are used in other countries. In general, the costs of recycled water schemes are recovered from a combination of:

- charges levied on users of recycled water, which can include volumetric charges as well as up-front capital contributions and developer charges
- higher charges on the general customer base
- contributions and subsidies from governments.

An overview of the approaches used in Victoria, Queensland and San Diego is provided below.

19 SOPA submission to IPART *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Issues Paper,* 2005.

20 ACIL Tasman, *Pricing for Recycled water*, Water Services Association of Australia – Occasional Paper No. 12. February 2005.

3.3.1 Victoria

The Essential Services Commission in Victoria (ESC) recently released its final decision on the Water Price Review[21] for Victorian water agencies. This decision requires water businesses to set recycled water prices according to the following principles:

- revenue should be maximised with reference to the price of substitutes and customers' willingness to pay
- prices should cover the full cost of providing the service unless there are identified public benefits or to meet Government targets
- prices must include a variable component to provide appropriate signals for resource management.

Where costs associated with providing recycled water are not fully recovered, water businesses must demonstrate:

- that they have assessed the costs and benefits of the recycled water project
- that they have identified how any revenue shortfall will be recovered
- that there has been consultation about willingness to pay for the benefits of recycled water if the revenue shortfall is to be recovered from customers.

3.3.2 Queensland

In Queensland, where the provision of water services and their prices are the responsibility of local government (overseen by the Queensland Competition Authority), a variety of approaches to recycled water pricing are used.

Where recycled water schemes can meet environmental licence conditions more cost-effectively than sewage treatment plant upgrades, recycled water is often provided free of charge. Some schemes have a price path that starts at a low level (to encourage uptake) and rises over time as acceptance and willingness to pay increases. Some schemes are commercially viable and prices are set on a contract basis for full cost recovery (eg, BP Luggage Point purchases around 10 megalitres a day).

Where customers pay for recycled water, the price of these services varies. With the exception of a few schemes using recycled water for high-value use, prices are only around 30 per cent of the potable water price.

Subsidies from the State Government of up to 50 per cent of capital costs are available for recycled water projects subject to a public benefit test. Subsidies are reduced where there is a private benefit (eg, income from sales to industry). New funding programs have recently been announced with an additional $10 million per year available for measures that reduce potable water consumption. Funding is allocated on a case-by-case basis to meet targets in Councils' Total Management Plans.[22]

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21 Essential Services Commission, *Water Price Review Final Decision - Metropolitan and Regional Businesses' Water Plans 2005-06 - 2007-08*, June 2005.

22 Queensland Department of Local Government and Planning, *Local Government Infrastructure Grants and Subsidy Programs 2006-11,* May 2005.

In December 2005, the Queensland Government released a *Manual for Recycled Water Agreements in Queensland* to guide stakeholders in developing a contract for the supply and use of recycled water. This document provides guidance on approaches to pricing. The Queensland Department of Natural Resources and Mines is also conducting a review of water pricing (including recycled water) to promote water efficient use for urban areas.[23]

3.3.3 San Diego

The City of San Diego in the USA currently imports approximately 90 percent of its total drinking water supply from Northern California and the Colorado River. In addition to this, around 25,000 megalitres of water is recycled each year. In response to increased water demand due to a growing population, the San Diego Water Department is examining alternative water resources to meet these future demands. A reuse study is underway to identify and evaluate recycled water opportunities.

Currently San Diego has a common price for all recycled water, which is about 50 per cent of the potable water price. The lower price of recycled water reflects the fact that sewer revenue offsets some of the costs of producing recycled water. This means that treated effluent is provided at a nominal cost to the agency. The recycled water price also takes into account the value of financial incentives the water agency receives for implementing recycled water projects.[24]

[23] Queensland Environmental Protection Agency, *Manual for Recycled Water Agreements*. December 2005

[24] City of San Diego Water Department (2005) www.sandiego.gov/water/ (accessed 16 January 2006).

4 WHAT FACTORS SHOULD BE CONSIDERED WHEN PRICING RECYCLED WATER SERVICES IN THE FUTURE?

Recycled water has some particular characteristics that need to be taken into account when determining its price. Recycled water forms part of an integrated system along with water and sewerage services, and some of its costs are shared with these other services. At the same time, recycled water can be a substitute for potable water from dams and other sources (such as desalination plants). When recycled water is used in this way, it can generate external costs and benefits for the broader community and the environment.

In addition, like other sources of water, there is a close relationship between the demand for recycled water and its price – if demand is high, the costs of supply can be spread over a larger volume of water so the price per unit can be lower. However, the price of recycled water will also affect demand. If suppliers charge more for recycled water than customers are prepared to pay, there will be no demand for the service.

Once the broad level of costs to be recovered through recycled water charges has been determined, taking into account customers' willingness to pay, the next question to address is the structure of recycled water charges. Price structure affects the timeframe over which the costs of supply can be recovered, the price signals sent to customers and suppliers, and the stability of the agencies' revenue stream.

Given this, it will be important for the Tribunal to consider:

- how the costs of providing recycled water should be estimated, and what costs should be reflected in its prices
- the need, if any, to incorporate a proxy for willingness to pay in the determination of recycled water prices
- how costs should be distributed between different charges, or the appropriate structure for recycled water prices.

4.1 How should costs be determined and recovered through recycled water prices?

There is a range of cost factors that needs to be considered by regulators when setting recycled water prices. These cost variables include the marginal costs of supply, the direct costs of supply, and the costs of supply that are shared with other water and sewerage services (joint costs). It may also be appropriate to take into consideration the avoided costs associated with the use of recycled water, the external costs and benefits associated with the use of recycled water, and the costs associated with meeting mandated targets for recycled water use.

4.1.1 Marginal costs

Economic theory suggests that the efficient price for a given product equals its marginal cost – that is, the cost of producing an additional unit of that product. This price is efficient because it encourages an optimal allocation of resources in the economy via the signals that it sends to consumers and producers. Marginal cost pricing makes consumers aware of the economic costs of their consumption, so they can make purchasing decisions accordingly. It also encourages efficient investment in supply.[25]

Short run marginal cost (SRMC) is the cost of supplying an extra unit of output when capital is fixed. In the water industry, large indivisible capital costs mean that the SRMC is very low and pricing at this level does not recover average costs of supply.

Long run marginal cost (LRMC) is the cost of supplying an extra unit of output when capital is variable. In the water industry, LRMC is often calculated as the least cost solution for balancing demand and supply in the long term (eg, 30 years).[26] This was the approach the Tribunal took in the recent water and sewerage price review.

When an agency provides water, sewerage and recycled water services, the marginal cost of one extra unit can be defined as the change in total costs of producing all services arising from producing one extra unit of the service in question. If a new recycled water project impacts on the costs of producing the other services, its marginal cost may vary from the costs of the resources directly associated with its production.[27]

The Tribunal seeks stakeholders' views on how marginal costs may be incorporated into recycled water prices.

4.1.2 Direct costs of supply

The direct costs of recycled water projects can vary widely and will depend on the nature of the project, its location and the quality of the recycled water needed for specific end-uses. Broadly, direct costs can be grouped into capital, operating and administration costs:

- Capital costs include the costs of planning, construction of additional treatment plants, trunk mains and reticulation systems and storage capacity. Costs incurred by customers to access recycled water such as conversion of equipment, plumbing, on-site treatment are also part of the direct capital cost of a scheme.
- Operating costs include the annual costs incurred to maintain and operate the recycled water system as well as any additional treatment and disposal costs incurred after the recycled water has been used. Costs of ongoing monitoring and compliance with regulatory requirements are also operating costs attributable to a scheme.
- Administration costs include marketing, education and consultation programs, legal costs, and metering, billing and other customer related costs.

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25 IPART, *Investigation into Price Structures to Reduce the Demand for Water in the Sydney Basin - Issues Paper,* December 2003.

26 ACIL Tasman (2005), *Pricing for Recycled Water – Water Services Association of Australia Occasional Paper no. 12.*

27 *Ibid.*

The Tribunal seeks comments on the direct costs of recycled water that should be incorporated into prices.

4.1.3 Joint costs

Recycled water is one part of the broader water and sewerage system. This means that some costs of providing recycled water are shared with costs of providing other services. These costs are called joint costs. For example, major treatment plants traditionally used to treat sewage prior to disposal can also produce recycled water. Similarly, corporate overheads (eg, billing and information systems) typically represent a joint cost.

The Tribunal seeks stakeholder comments on how joint costs might best be reflected in recycled water pricing arrangements.

4.1.4 Avoided costs

Avoided costs are those costs that an agency currently incurs to undertake its day-to-day operations, which it would not incur if a recycled water project proceeds. Avoided costs can include the deferral or resizing of capital works in the water or sewerage systems.

The supply of recycled water may also reduce some costs elsewhere in the system – for example, by deferring water supply augmentation or avoiding the need to upgrade sewage treatment plants to meet environmental regulations. The Tribunal will need to consider how best to deal with costs that are avoided as a result of a recycled water scheme, particularly where the beneficiaries of the avoided costs differ from the users of the recycled water.

The Tribunal seeks comments on the likely extent of avoided water and sewerage costs that might arise as a result of recycling water.

4.1.5 External costs and benefits

The use of recycled water can also lead to other costs and benefits for the whole community. Known as 'externalities', these costs and benefits are part of the economic value of recycled water and should if possible, be reflected in prices.

Examples of externalities related to recycled water include:

- improved river water quality due to a reduction in the discharge of nutrients to waterways from treatment plants with low levels of sewage treatment
- learning and innovation in recycled water technology
- possible health risks from exposure to recycled water
- reduced environmental impacts associated with water extraction for potable use.

As externalities are often not quantified, determining their value and reflecting them in prices can be difficult. A consistent and robust approach is needed so that external benefits are not used as a 'balancing item' to justify recycled water projects that would not otherwise be economically or financially viable.

Where a recycled water project is economically justified because of positive externalities but is not financially justified from the water agency's point of view, part of the cost could be considered a community service obligation (CSO) and be recovered from the community (ie, taxpayers) as the beneficiary of the externality.

The Tribunal seeks comments on how external costs and benefits associated with recycled water projects might best be estimated for incorporation into recycled water prices. The Tribunal also seeks comments on how these costs might be recovered.

4.1.6 Costs of meeting mandated targets

Recycled water schemes built to meet mandated targets (reflecting broader social benefits) may impose higher costs on water agencies and water users relative to other approaches. Again, it may be considered appropriate to recover at least part of these costs either through direct government funding such as grants or CSO payments. Alternatively, these schemes could be treated as a legitimate 'cost of doing business' and costs recovered from the broad customer base in the same way that expenditure on meeting environmental licence requirements is recovered.

The Tribunal seeks comments on appropriate means of recovering costs of meeting mandatory recycled water targets.

4.2 Should willingness to pay for recycled water services form part of the pricing decision?

The previous section considered a range of cost related issues the Tribunal will need to consider when setting recycled water prices. As discussed in Chapter 3, willingness to pay is also a criterion in the decision-making process for pricing recycled water in some other jurisdictions where it can form a price ceiling.

It is, however, difficult to estimate the amount potential customers are prepared to pay for new products and services. A considerable degree of judgement would be needed to establish a proxy for willingness to pay for recycled water. This judgement could in turn generate significant regulatory uncertainty that might deter potential investors.

Furthermore, the price that can be charged for recycled water is usually bounded by the price of substitutes. n many instances, that substitute price should provide sufficient consumer protection, and there is no reason to introduce further uncertainty by allowing consumers' willingness to pay when setting the price of recycled water. However, in some cases, other factors can increase or decrease customers' willingness to pay. hese are discussed below.

4.2.1 Price of substitutes

Where the prices of alternative water sources are very low, as is the case for water extracted directly from rivers to irrigate crops or pastures, customers may be willing to pay the same or a higher price for recycled water than its substitutes. For example, when alternative supplies are limited or if recycled water contains nutrients or minerals necessary for production, and therefore leads to a reduction in other input costs. Conversely, customer perceptions about potential health risks or the fact that recycled water is of lower quality

than potable water can reduce willingness to pay to some margin less than the price of potable water.

In Sydney, the Tribunal considers that the price of potable water is equal to the long run marginal cost of water supply. Thus, by definition, in the medium to longer term, more potable water can be made available at this price, and the price of potable water forms the efficient upper limit for recycled water prices in Sydney. Recycled water would then be willingly purchased in those areas of Sydney where its cost of production, and therefore its price, was sufficiently attractive relative to the price of potable water (or water from another source). Moreover, in those parts of Sydney there should be no need to force people to use recycled water, as the alternative sources of additional potable water are price efficient.

4.2.2 Mandated recycled water schemes

Where recycled water schemes in new development areas are put in place to meet BASIX requirements it will, however, be mandatory for each house to be connected to the recycled supply for uses such as garden watering, toilet flushing and laundry use.

The costs of installing recycled water infrastructure will ultimately be paid for by a combination of developer charges, water and sewerage periodic charges and land prices. While a household can choose to use more or less potable and recycled water depending on the relative prices, the key decision is whether to purchase a house in the development area.

Where recycled water schemes are mandated, costs of providing these schemes may result in recycled water prices that are higher than the price of substitutes. If there are broader social benefits resulting from these schemes, there may be a case for spreading some costs over the water and sewerage customer base. Alternatively, if for some reason, the price of substitute water is lower than efficient levels, there may be an argument for providing a subsidy so that recycled water schemes are financially viable where they provide water at less than the long run marginal cost of water supply.

The Tribunal is interested in stakeholder views on taking account of customers' willingness to pay when making a determination on recycled water pricing.

4.3 What structure is appropriate for recycled water prices?

Once the costs to be recovered via recycled water prices have been established and any other factors relevant to determining the price levels identified, the structure of prices must be considered. Costs can be recovered through a combination of fixed and volumetric periodic charges, developer charges and up-front capital contributions.

The way in which prices for recycled water are structured will need to ensure that the structure itself does not act as a disincentive for customers to connect or use recycled water, or for agencies to undertake a scheme. For example, large fixed charges can deter small users from connecting to the system while reliance on high volumetric charges can increase the revenue risk agencies are exposed to.

4.3.1 Periodic charges

Periodic or recurrent charges for recycled water might include a volumetric charge, a fixed charge, or a combination of the two.

In determining the level of volumetric charges, the Tribunal would need to consider:

- sending appropriate signals about the cost of providing additional water
- ensuring customers have sufficient control over the level of their bill
- avoiding perverse incentives (eg, excessive use of recycled water).

In determining the level of fixed charges, it would need to consider:

- generating sufficient revenue to cover the water agency's costs and ensuring its long-term financial viability to provide sufficient revenue stability.

4.3.2 Developer charges

The appropriate role and level of developer charges needs to be considered when setting prices to recover the total costs of specific recycling schemes. In the past, some stakeholders have argued that as recycled water schemes may reduce the need for excess capacity in upstream water and sewerage systems, developer charges for these services should be discounted to reflect this.

4.3.3 Up-front capital charges

In some cases, the costs of new infrastructure required for a recycled water supply has been levied on major users as an up-front charge. This can help agencies manage risks associated with providing new services where the extent of future demand associated with a particular development or project is uncertain.

Similarly, for residential developments, part or all of the infrastructure cost may be recovered in the price of the land, rather than in specific charges for recycled water.

The Tribunal seeks comments on how recycled water prices can be structured to provide appropriate signals to users while meeting revenue requirements and having regard to equity considerations.

The Tribunal also seeks comments on discounting developer charges where recycled water schemes are installed to reflect lower capacity costs for traditional water and sewerage services.

5 WHAT ARE THE MAIN OPTIONS FOR SETTING RECYCLED WATER PRICES?

One of the key decisions the Tribunal will need to make as part of this review is the level of regulatory intervention that is appropriate for recycled water pricing. The aim of price regulation is to ensure efficient delivery of services in the absence of competitive markets and avoid the exercise of monopoly power, particularly for essential services such as water. However, where prices can be negotiated equitably between customers and suppliers a more light-handed approach can provide greater flexibility and may allow prices to respond better to changes in costs or technology.

The Tribunal has identified three possible approaches it could take to recycled water pricing, with differing degrees of intervention. These include:

- the market decides the price of recycled water services
- the Tribunal sets prices
- the water agencies set prices that are consistent with a pricing methodology established by the Tribunal.

Each of these options is discussed below. A combination of pricing options could be used if a single approach does not achieve efficient pricing outcomes for all uses of recycled water. The level of auditing to be applied to recycled water prices once they are determined and possible pricing arrangements for sewer mining are also discussed.

5.1 The market decides the price

Under this option, the Tribunal would not intervene in price setting and the water agencies would continue to set prices for recycled water projects by direct negotiation with customers or developers. This approach may be acceptable if potential recycled water customers have sufficient market power to negotiate prices directly with suppliers.

It is also likely to mean that recycled water projects would only be undertaken if they were commercially viable or they provided some other benefit to either the supplier or the customer (eg, a more secure water supply where potable water restrictions are in place).

This option may not be appropriate where recycled water schemes are mandated to meet broader social benefits, especially for residential recycled water users that have no choice but to use recycled water (eg, in order to meet BASIX requirements).

Some disadvantages of this approach include that:

- there is a greater potential for agencies to abuse their monopoly powers
- equity issues may arise due to inconsistencies and a lack of transparency in pricing practices between agencies
- once prices are in place, it is difficult to adjust them.

The Tribunal does not wish to intervene in price determination if the market can arrive at efficient prices in the absence of price setting. The Tribunal will need to be satisfied that there are good arguments for changing its current approach, particularly for large customers.

5.2 The Tribunal sets prices

Under this option, the Tribunal could set prices on a scheme by scheme basis, or set one 'postage stamp' price for all recycled water schemes regardless of their different cost structures.

5.2.1 Scheme by scheme prices

This approach would involve the Tribunal making individual price determinations for projects as they arise. Some benefits of this approach include:

- the basis for prices would be transparent
- prices would be determined based on well developed scheme costs
- the efficiency of each scheme would be evaluated when establishing prices.

However, this option would generate a large volume of work for the Tribunal in conducting regular determinations and for agencies in data collection and reporting. As a result, it would be likely to impose significant regulatory costs on the provision of recycled water services.

5.2.2 Postage stamp price

"Postage stamp pricing" refers to the setting of a common price for a service in a geographic area, irrespective of variations in the cost of supplying the service in different parts of that area (just as there is one price for posting a standard letter within Australia, whether it has to be delivered to the next suburb or to another State).

For recycled water services, postage stamp pricing could be implemented by setting recycled water prices with reference to the potable water price (eg, a percentage of it) or as an 'average' cost across the recycled water customer base, similar to existing water and sewerage prices.

This approach is likely to provide administrative simplicity and is easy for customers to understand, creating a clear price signal. It may also be a more equitable approach for residential recycled water customers where schemes are mandated (ie, they do not have a choice about whether to use recycled water).

However, a postage stamp approach would mean that the price of recycled water services would not accurately reflect the costs of providing infrastructure and services in different locations. This could cause distortions in investment in recycled water projects. Also, recycled water is a much more heterogeneous product than water and sewerage services due to the differences in end-use and water quality.

5.3 Agencies set prices using the Tribunal's pricing methodology

Under the IPART Act, the Tribunal may set maximum prices or may determine a methodology for setting maximum prices. Setting a methodology ensures a consistent approach while allowing prices to vary to reflect differences in costs.

This approach is currently used for determining developer charges. The Tribunal established a methodology that the water agencies are required to use when calculating developer charges. This methodology allows these charges to reflect the diversity of costs associated with providing infrastructure to different development areas. This approach provides signals for resource allocation and usage and ensures the financial viability of extensions of urban water infrastructure. A similar approach could be taken for recycled water prices.

The Tribunal seeks stakeholder views on:

- ***the most appropriate option(s) for determining prices for recycled water services***
- ***the advantages and disadvantages of the options discussed above***
- ***whether it is possible to develop a practical and robust methodology for the pricing of recycled water***
- ***whether a single approach can be used for all customer types and uses of recycled water.***

5.4 Auditing of recycled water prices

As discussed in section 2.2, the Tribunal currently sets water, sewerage and stormwater charges for the four water agencies. These prices are determined for a finite period (usually between three and five years). Capital and operating expenditures for providing these services are reviewed at the beginning and the end of each price path to evaluate their efficiency and prudence. Prices are set to recover only the efficient and prudent costs of service provision.

The water agencies set developer charges by applying the methodology established by the Tribunal. The methodology aims to reconcile the water businesses' revenue from developer charges and periodic charges and to make the link between them explicit. Developer charges are established in Development Servicing Plans (DSPs) for different development areas. Agencies must review their DSPs every five years, or as required by the Tribunal following a review of periodic charges.

In the absence of effective competition in the recycled water market, the Tribunal is concerned that if recycled water prices are not audited for efficiency, inefficient work practices may develop and/or water agencies may over-estimate the costs of a recycled water scheme to earn excess profits.

The Tribunal seeks comments on whether it should have an audit role, to ensure the ongoing efficiency of recycled water prices. If so, is either of the above models appropriate for reviewing recycled water prices, and how often should reviews take place?

5.5 Sewer mining

As part of this review, the Tribunal will consider determining prices for sewer mining. As discussed in Chapter 3, the Tribunal has previously set a sewer mining price of zero for Sydney Water but did not set a sewer mining price in the 2005 determination pending the review of recycled water prices.

The Tribunal's report *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region* noted that sewer mining projects are likely to feature among proposals for recycled water and third party access. It also noted that where a sewer mining scheme has the

potential to lower sewage treatment and disposal costs for the incumbent provider of sewerage services, pricing at zero could be an inefficient impediment to that scheme.

Alternatively, it may be appropriate to have a negative price or 'credit' for sewer mining. Such a credit would reflect reasonable estimates of the avoided costs of sewerage service provision. This is consistent with the Tribunal's recommended approach to pricing access to infrastructure, the Efficient Component Pricing Rule (ECPR).[28] An ECPR approach to calculating the sewer mining credit would involve estimating the costs a water agency would avoid if the sewer mining scheme proceeded ('avoided costs'), ie, the costs of treating and disposing of sewage.

When reviewing arrangements for sewer mining, the Tribunal will consider the relative bargaining power of water agencies and potential sewer miners. The Tribunal will need to be satisfied that making a determination for sewer mining will not stifle market operation and that it will result in prices that are more efficient. The Tribunal will consider alternatives to determining prices for sewer mining, such as a 'negotiate/arbitrate' model where prices are negotiated between the relevant players and a regulator arbitrates any disputes and provides guidance.

It will also be important that sewer mining prices established under any model do not distort market participation in an open access regime or other forms of recycling. As in other recycled water projects, non-price factors such as security of supply, or public good outcomes are likely to play a role in the investment decision.

The Tribunal seeks views on the appropriate level of price regulation for sewer mining.

The Tribunal also seeks suggestions about possible approaches to determining prices for sewer mining projects, and on whether it is possible for water agencies to reliably calculate avoided costs that may be associated with sewer mining projects.

[28] IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region – Final Report.* November 2005

6 HOW SHOULD THE TRIBUNAL SELECT THE BEST OPTION?

To select its preferred option of setting recycled water prices, the Tribunal will need to consider each option to assess whether it will meet some key objectives for recycled water pricing and identify any trade-offs that need to be made. Some of the possible objectives it could use to assess the pricing options are:

- Economic efficiency – is the option likely to result in prices that encourage efficient investment decisions by suppliers and appropriately signal the costs of supply to users?
- Revenue adequacy – will the pricing option allow the water agency to recover the costs of supply, while not allowing them to earn monopoly rents?
- Transparency and administrative simplicity – will the option facilitate transparent prices that send clear signals to customers and be simple for water agencies to administer?
- Equity – what are the social outcomes of the option, and will the option share costs equitably between new and existing areas?
- Competitive neutrality – will the option result in prices that ensure consistent treatment for all potential suppliers in the market, whether they are private companies or Government-owned utilities?

6.1 Economic efficiency

Prices of recycled water should ensure that this resource is supplied and used efficiently. According to economic theory, there are three types of efficiency – productive efficiency, allocative efficiency and dynamic efficiency.

Productive efficiency is said to be achieved when a given output is produced at minimum possible cost, or inputs are minimised for a particular level of output. This type of efficiency is relevant to the goal of delivering water and sewerage services at the lowest possible cost to the consumer.

Allocative efficiency is maximised where resources are allocated to achieve the maximum social benefit, including any external costs and benefits from the activity. Allocative efficiency for monopoly services can be encouraged through regulating price outcomes.

Dynamic efficiency relates to processes of technological and managerial innovation – the ability of suppliers to improve the range, quality and cost of services, increase productivity and to respond to emerging market developments. Removing artificial regulatory barriers to entry may be important in promoting the investigation and commercialisation of new water sources.[29]

In the context of water services, efficient prices will aim to ensure that water demand and supply are balanced at the lowest long-term net social cost. Efficient recycled water prices will make consumers aware of the economic costs of their consumption, so they can make purchasing decisions accordingly. They will also encourage optimal investment in the supply of recycled water.

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[29] IPART, *Investigation into Water and Wastewater Service Provision in the Greater Sydney Region - Issues Paper,* May 2005.

The Tribunal seeks comments on how recycled water prices can incorporate economic efficiency objectives.

6.2 Revenue adequacy

The economic efficiency of any project must be subject to revenue adequacy. Recycled water providers must receive adequate revenue to finance the services. Due to large economies of scale in the water industry, pricing at the SRMC will lead to a revenue shortfall. In addition, the long asset lives in the water industry mean that minimising the LRMC requires building temporary excess capacity into the system. A challenge for recycled water pricing is how best to recover costs, while minimising any efficiency losses.[30]

The Tribunal seeks comment on how efficient pricing and revenue adequacy objectives can be balanced.

6.3 Transparency and administrative simplicity

Pricing arrangements for water and sewerage services should be simple for water agencies to administer and easy for customers to understand. Complicated pricing systems can increase administration and regulatory costs and reduce the effectiveness of price signals (causing inefficient use).

Part of the Tribunal's role is to ensure that pricing of monopoly services is transparent so that customers are assured that water agencies are not abusing their monopoly powers. The pricing principles outlined by the Council of Australian Governments (COAG) recognise that, in some cases, cross subsidies will exist in the provision of water and sewerage services, but require that these be reported. Similarly, where providers must deliver services at less than the full cost of provision, this should be disclosed.

6.4 Equity

Given that water is essential to human life, there are social dimensions associated with setting prices. Under Section 15 of the IPART Act, the Tribunal is required to consider the social impacts of its pricing decisions.

If recycled water projects are installed in new residential development areas to meet BASIX requirements, these customers will not have a choice about whether to connect to the scheme. The Tribunal will consider the equity impacts for these customers of different recycled water pricing scenarios.

The Tribunal will also have to consider equity arrangements between residents of newly developed areas who will have recycled water available and water users in existing urban areas where this service is unlikely to be available in the foreseeable future.

30 ACIL Tasman, *Pricing for recycled water. Water Services Association of Australia – Occasional Paper No. 12*, 2005.

6.5 Competitive neutrality

The Tribunal's approach to recycled water pricing must have regard to the fact that third party access is likely to introduce competition in supplying water services that have traditionally been provided by government monopolies.

Competition has implications for both new entrants and incumbent water agencies. It will be important to avoid the creation of barriers to entry for new competitors, while at the same time ensuring that service standards and environmental and health regulations are met.

The Tribunal seeks comment on whether:

- ***the evaluation criteria discussed above are appropriate for assessing recycled water pricing options and whether there are other objectives that should be considered***
- ***any trade-offs between objectives that need to be considered in assessing recycled water pricing options***
- ***it needs to consider any additional issues with regard to competition in the water industry when determining recycled water prices, and how these issues can be addressed.***

APPENDIX 1 INITIATIVES TO INCREASE RECYCLED WATER SUPPLY AND USE

The NSW Government is currently developing policies and implementing programs to ensure the long-term sustainability of water supplies and protect the environment. A number of these will recycled water supply and use to increase in the near future. These are discussed below.

A1.1 Identification of new sources of water

NSW is currently experiencing one of the longest droughts in its recorded history. Even when this drought breaks, there will be a need to manage the demand for and supply of water. The current drought and resulting focus on water shortages has highlighted the fact that water demands are nearing the sustainable yields of existing water storages for all the metropolitan water agencies. Although each agency faces its own unique set of circumstances, all will eventually face the need to augment supply capacity as populations grow.

Building new dams may not be environmentally appropriate, nor necessarily the most reliable and cost effective way to source water. In addition, it is now widely recognised that drinking-quality water is not needed for all uses of water. Consequently, agencies are considering alternatives to traditional water sources for future supplies, including the development of recycled water strategies.

A1.2 The Building and Sustainability Index

The NSW Government's Building and Sustainability Index (BASIX) currently requires reductions in average water use in new houses and new multi-unit dwellings built in NSW. From July 2006, it will also apply to alterations and renovations. The BASIX water targets vary according to location (based on climate). For Sydney, the Hunter and the Central Coast the target is 40 per cent reduction in water use.

Water savings can be made by installing water efficient appliances in conjunction with either a 5000 litre rainwater tank or recycling via dual reticulation. The option selected will be largely at the discretion of developers.

Where recycled water schemes are built in new land release areas, households will effectively have no choice about whether or not to use recycled water. In addition, costs of building and operating schemes are likely to vary significantly depending on location.

Several water agencies have indicated that they have plans for large-scale residential recycled water schemes in their areas of operation to meet the BASIX requirements.

A1.3 The Metropolitan Water Plan

The State Government released its Metropolitan Water Plan for Sydney in October 2004. This plan sets out a range of actions to be implemented over the next 25 years to ensure sustainable water supplies. These actions include demand management programs to reduce water use and augmenting supply by accessing water deep in existing dams, increasing transfers from the Shoalhaven, desalination and recycled water projects.

The Metropolitan Water Plan identified the potential for recycled water to substitute for up to 80,000 megalitres per year of potable water by 2029. To progress this, the Government has developed a recycled water strategy, which aims to maximise the use of recycled water to replace potable water where feasible.

The strategy identifies projects that will use recycled water for residential, commercial/industrial and agricultural purposes, as well as to replace environmental flows in the Hawkesbury-Nepean River. At this stage, it is not proposed that recycled water be used for drinking purposes.

A1.4 Increased private sector involvement

One of the key aims of the Metropolitan Water Plan is to encourage the involvement of the private sector in developing innovative solutions to Sydney's water supply/demand imbalance, and in particular the provision of recycled water services.

The Government recently announced that it will release a series of expressions of interest for private sector provision of recycled water projects in Sydney. The first of these projects is a recycled water scheme at Camellia near Parramatta that could deliver up to 2,000 megalitres of recycled water a year for industrial purposes. In addition, several other recent initiatives and events are likely to result in increased public sector involvement in the supply of water and sewerage services, including recycled water services. These include:

- the Tribunal's recent review of industry arrangements for water and sewerage services
- the establishment of regimes for third party access to parts of Sydney Water's sewerage system
- the establishment of a water savings fund to stimulate private sector investment in water conservation measures and water recycling in the Sydney area.

A1.5 Water Savings Fund

In 2005, the NSW Government established a Water Savings Fund to stimulate private sector investment in water savings measures and water recycling in the Sydney area. Funds of $30 million per year over four years will be made available on a contestable basis, through regular public calls for expressions of interest. Sydney Water will contribute to the fund.

It is possible that some monies from the fund will be used to supplement investment in recycled water schemes where the external benefits support the scheme being implemented.

The first round of expressions of interest has now closed. Over 70 submissions are now being considered for funding.

A1.6 Increases in potable water prices

In 2005 the Tribunal released determinations for water, sewerage and stormwater prices for the metropolitan water agencies.[31] As part of the review leading up to these determinations the Tribunal considered a range of prices charged by the agencies. The Tribunal specifically considered the volumetric price for each unit of water sold by the agencies.

The Tribunal had regard to the Long Run Marginal Cost of supplying additional increments of water when setting the water usage prices to be charged by Sydney Water. The Tribunal believes that the water usage charges determined fall within the range of estimated long run marginal costs of water supply. Potable water prices therefore constitute a firm basis against which recycled water schemes can compete and against which their viability can be evaluated.

A1.7 National Water Initiative

In its review of recycled water prices, the Tribunal will have regard to the requirements of the National Water Initiative (NWI) endorsed by the Council of Australian Governments and to the earlier Water Reform Framework

The NWI is a comprehensive strategy to improve water management across the country. Among other things, the NWI requires progressive moves towards full cost recovery and consumption based pricing. It encompasses a wide range of water management issues and encourages the adoption of best-practice approaches to the management of water in Australia. In particular, the NWI aims to achieve better and more efficient management of water in urban environments, for example through the increased use of recycled water and stormwater.

The NWI commits to the development of pricing policies for recycled water and stormwater that are congruent with pricing policies for potable water, and stimulate efficient water use no matter what the source, by the end of 2006.

[31] For Sydney Water and Hunter Water the determinations set maximum prices until 30 June 2009. For the Councils, the Tribunal made a one-year determination. The Tribunal is currently reviewing the Councils' prices for a determination from 1 July 2006 to 30 June 2009.

APPENDIX 2 THIRD PARTY ACCESS

A2.1 NSW access regime

In December 2004, the Government asked the Tribunal (under Section 9 of the IPART Act) to provide independent advice on pricing and alternative arrangements, including possible private sector involvement, for the delivery of water and sewerage services in the Greater Sydney region.

In its final report, IPART recommended, among other things, the establishment of a state-based access regime covering water and sewerage infrastructure. The regime would be a negotiate/arbitrate regime and would adopt the Efficient Component Pricing Rule (ECPR).

On releasing the Tribunal's report, the NSW Government was broadly supportive of its recommendations and announced the development of a state-based access regime for services provided by means of significant water and sewerage infrastructure.

It is envisaged that under any access arrangements, the private sector will utilise existing water and sewerage assets in competition with water agencies. Agencies and new entrants into this field will have stringent public health, consumer protection and environmental obligations placed on them.

A2.1 National access regime

Over several years, Services Sydney (a private sector firm) has made submissions to Sydney Water and the NSW Government regarding a proposal to enter the sewerage service market. When the proposal was not successful, it pursued the matter with the National Competition Council and, more recently, the Australian Competition Tribunal.

In December 2005, the Australian Competition Tribunal (ACT) deemed that parts of Sydney Water's sewerage system are declared services under Section 44H of the Trade Practices Act. The ACT was satisfied that the criteria for declaration were met. In particular that:

- declaration would promote competition in the markets for sewage collection, sewage treatment and recycled water
- declaration would not be contrary to the public interest, notwithstanding that the NSW government foreshadowed it was developing a state based access regime.

The ACT declared the following services (and therefore deemed them open to third party access):

- The transportation of sewage provided by means of the North Head, Bondi and Malabar Reticulation Networks, from a customer's boundary trap to points of interconnection.
- Connection of new sewers to the North Head, Bondi and Malabar Reticulation Networks at points of interconnection.

The declaration is effective on and from 21 December 2005 and will expire on 20 December 2055.

The decision grants third party access to services that have been declared, governed by Part IIIA of the Trade Practices Act. The ACCC would arbitrate any access disputes under such a regime. The implications of this for recycled water are that a third party service provider could access effluent from any one of the three reticulation networks and set up its own sewage treatment and water recycling plant near potential customers. While the Tribunal does currently not have the power to set recycled water prices for providers other than Government monopoly providers, this determination may inform such negotiations. The Tribunal's pricing power could be expanded to cover third party providers if the NSW Government deemed this appropriate.

Any determinations by the Tribunal in relation to the pricing of recycled water will need to ensure that pricing systems are even-handed irrespective of who the final supplier might be (ie, outcomes should be competitively neutral).

APPENDIX 3 POTENTIAL USES OF RECYCLED WATER

A3.1 Residential recycling

Water used for non-drinking purposes (toilet flushing, garden use, laundry and car washing) accounts for approximately 35 per cent of residential water demand. In new land release areas, dual reticulation (two sets of pipes – one for potable water and one for recycled water) may be installed so that recycled water can be used for these purposes. It is not cost-effective or practical to implement large-scale residential recycled schemes in existing suburbs.

Residential recycling can reduce demand for potable water significantly and research shows that customers appreciate the environmental, continuity of supply and price benefits of recycled water supplies. These benefits must be considered along with the costs of residential recycled water schemes when establishing prices.

A3.2 Commercial and industrial recycling

Recycled water can also be used in non-residential premises to replace drinking water for industrial processes, irrigation and toilet flushing.

There are several commercial and industrial recycled water schemes already in existence in Sydney, the Hunter region and the Central Coast. There are other opportunities to recycle water for industrial use where premises are located close to a source of recycled water to minimise costs.

There may be financial and other benefits (such as more consistent water quality) to these customers from using recycled water.

A3.3 Environmental Flows

It is now widely recognised that river extractions for consumptive uses have damaged the health of rivers. As well as ecological impacts, poor river health affects the tourist, agriculture, fishing and recreation industries.

Water Sharing Plans are being implemented across NSW to allocate water between users, including the environment. The NSW Government recognises that improving the health of river systems requires greater environmental flow releases from dams or by reducing allocations for other users.

Recycled water treated to very high levels may be used to replace current river releases from dams and achieve future increased environmental flow requirements. The costs of using recycled water for environmental flows can be recovered in a number of ways. These will be considered as part of the recycled water price review.

A3.4 Agricultural recycling

Recycled water can be used to reduce extractions from rivers to irrigate crops or pasture as well as to reduce effluent discharge to river systems.

The NSW Government is actively looking at opportunities to implement agricultural recycling. In many cases, irrigators currently take water directly from rivers, rather than using the potable supply. In these cases, providing recycled water to this market will not directly reduce demand for potable water. It may however, reduce the amount of water taken from river systems for irrigation purposes with beneficial consequences for river ecology. Improvements to river ecosystems may in turn, reduce the volume of water that needs to be released from dams for environmental flows, making more water available for potable use.

A key issue for these types of schemes is that recycled water schemes competing with river extractions are difficult to justify on commercial grounds due to the availability of low-cost river water.