Sydney Water Submission to the Independent Pricing and Regulatory Tribunal Review of Metropolitan Water Agency Prices

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Executive summary

SYDNEY WATER'S SERVICES

1 Sydney Water's area of operations covers a large part of the Sydney Basin from Gerroa in the south to Palm Beach in the north, and west to Mount Victoria. Sydney Water provides water, wastewater and stormwater services to nearly 4.2 million people in this region.

2 Its water services are supplied via 10 water filtration plants, which deliver 1.5 billion litres of drinking water a day via 20,867 kilometres of water mains, 260 reservoirs and 152 pumping stations. Sydney Water also collects and treats more than 1.3 billion litres of wastewater from homes and businesses each day via 23,014 kilometres of sewers with 31 sewage treatment plants. While stormwater is predominantly a local government responsibility Sydney Water also provides stormwater drainage facilities to approximately 450,000 homes and businesses.

BACKGROUND

3 Water and sewer charges in Sydney have come down considerably since the Tribunal started regulating Sydney Water's prices in 1992/93. Revenue per property has fallen by 36.5 per cent in real terms since 1993, while customers' ability to pay has increased. Water bills have fallen from 1.6 per cent of average weekly earnings in 1993 to 1.4 per cent today.

4 In recent years, this falling real revenue is in contrast to movements in prices of water and sewer services across Australia. The costs of water and sewer services to consumers Australia-wide have increased by around 1.4 per cent in real terms from June 1998 to June 2004 whereas Sydney Water's revenue per property has declined by 17.1 per cent over the same period.

5 While charges have been falling, standards have continued to increase, delivering increased service quality and reliability for customers, and positive environmental outcomes. Sydney Water's customer satisfaction has improved significantly over the last 10 years and remains very high.

6 Over the past two years Sydney Water has achieved significant service outcomes including:

- full compliance with drinking water quality requirements in the Sydney Water Operating Licence;
- full compliance with effluent quality limits set by the Environmental Protection Licences for sewage treatment plants; and
- a substantial reduction in leakage across the water network.

7 At the same time Sydney Water's operating environment has become increasingly difficult, with a reduction in revenue as a result of water restrictions associated with the current, severe drought, and increased focus on demand management to manage the supply/demand balance. Sydney Water's expected real rate of return on its regulated asset base in 2004/05 is expected to be 4.6 per cent, well below the Tribunal's allowed 5.6 per cent real return.

8 There will be ongoing demands for water supply into the future to meet the needs of existing customers and approximately 40,000 more people every year, while providing additional water for environmental flows in the medium term. This increased demand requires investment in infrastructure. The costs of providing these services and infrastructure to Sydney's growing population must be recovered from the customer base.

9 As water scarcity increases, Sydney Water continues to focus on reducing demand through its demand management initiatives and leakage reduction programs.

10 The current drought highlights the importance of appropriately managing Sydney's scarce water resources. In this context, it is important that prices be set to reflect the efficient cost of providing ongoing water services, so that consumers can make informed consumption decisions.

THIS SUBMISSION

11 The prices to be charged for water services from 1 July 2005 will be determined by the Tribunal as part of the 2005 Price Review process. To assist this process Sydney Water's submission sets out a clear case:

- justifying our expenditure requirements over the next four years on the basis of efficient operations and capital works;
- describing the improved security and service standards to be delivered through this expenditure;
- supporting tariff restructuring to provide increased emphasis on pay by use to encourage water conservation; and
- supporting prices based on the total capital and operating cost of providing services.

SYDNEY WATER'S EXPENDITURE REQUIREMENTS

12 To ensure costs are efficient for customers Sydney Water's operating and capital costs are driven by its whole of life approach to managing its assets. Sydney Water identifies the least cost options available to provide water, wastewater and stormwater services to customers as required by Sydney Water's regulatory obligations and customer contracts. Sydney Water has robust systems in place and continually evaluates expenditure, to ensure customers are getting value for money.

13 Based on the investment requirements to meet existing standards, and taking into account additional demands created by growth, improved standards and funding of backlog sewer programs, Sydney Water will need to invest approximately $2.6 billion over the next four years to meet the required service outcomes.[1]

14 Sydney Water plans to spend $3.54 billion on operating expenditure over the next four years, including purchasing bulk water and maintaining its asset base. After allowing for increases in bulk water costs Sydney Water's operating costs per property are projected to fall by 7 per cent from 2004/05 to 2008/09.[2] This is a difficult goal given the 12 per cent increase in Sydney Water's asset base and the projected 4 per cent increase in population over the period.[3] Sydney Water is delivering significant efficiency savings over the four year period through reductions in corporate overheads and productivity improvements in maintenance. These efficiency savings offset operations and maintenance cost increases arising from Sydney Water's more rigorous asset management framework and increasing asset base. Controllable costs, which account for around 32 per cent of Sydney Water's operating costs, are budgeted to decline by 20 per cent per property over the period from 2004/05 to 2008/09.

15 The key drivers of Sydney Water's operating and capital expenditure requirements over the next four years are:

Managing an expanding and aging asset base

- If laid end to end Sydney Water's sewer and water mains would stretch from Sydney to London about two and a half times. Maintaining these assets, which are predominantly underground, is a critical and ongoing part of Sydney Water's services to its customers.
- Over the next four years Sydney Water will invest $1.2 billion to meet its increasingly stringent service quality and reliability standards by:
    - replacing 320 kilometres of reticulation water mains and 41 kilometres of critical water mains to reduce service interruptions;

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1 All dollars in this submission are in real 2004/05 dollars unless otherwise stated.

2 The reduction in operating costs per property excludes the increase in bulk water costs over the period.

3 The increase in asset base is calculated on the total capital additions, including assets contributed free-of-charge, expressed as a proportion of 2003/04 Gross Replacement Cost of Assets.

- rehabilitating over 40 kilometres of sewers, including pipes in the critical Southern and Western Suburbs System from Liverpool to Malabar, to mitigate the risk of collapse;
- relining 320 kilometres of sewer pipes to reduce overflows to private property and the environment;
- reliability works on equipment and enhancement of sewage treatment plant performance at Bombo, Bondi, Cronulla, Glenfield, Liverpool, North Head, North Richmond, Picton, St Mary's and Warriewood to protect beaches and waterways and meet license requirements;
- renewal of water filtration plant equipment at the Cascades, Nepean, North Richmond, Orchard Hills and Warragamba plants and installation of reservoir mixers and chlorine analysers; and
- maintaining Sydney Water's 20,867 kilometres of water mains, 152 water pumping stations, 10 water filtration plants and 260 reservoirs and its 23,014 kilometres of sewer mains, 28 sewerage systems, 31 sewage treatment plants and 656 sewage pumping stations.

Rapid rates of population growth

- Sydney Water's population is projected to grow by an average of about 40,000 people each year for the next 30 years. This 1.2 million extra people is equivalent to the population of Adelaide moving to Sydney. At the same time, the average occupancy rate per household is decreasing. This means that over the next 30 years about 23,500 new dwellings will need to be built in Sydney Water's area of operations each year. More than 200,000 of these dwellings will be in new release areas, which are significantly more expensive to service than growth in established areas.
- Sydney Water will spend a total of $836 million over the next four years delivering the investment required to meet this growing demand to support the NSW Government urban land release plans and water conservation goals for new development (BASIX) by installing and extending water, sewerage and recycled water services.

Stringent regulatory obligations and customer expectations in relation to service and environmental outcomes

- Over the past few years Sydney Water has been working hard to improve the reliability and quality of its services. As a result our waterways are cleaner. Over the next four years Sydney Water will continue to meet increasing standards and increasing public standards by:
  - rehabilitating and augmenting the sewerage network to reduce sewage overflows in line with environmental protection licence requirements;
  - upgrading sewage pumping stations to reduce risk of dry weather sewage overflows;
  - works at Warragamba and Blackheath sewage treatment plants and implementing the Illawarra Wastewater Strategy at Bellambi, Port Kembla and Wollongong sewage treatment plants to meet increased standards of effluent discharge;
  - reducing pressure-related water main breaks and leakage;
  - installing gross pollutant traps and wetlands treatment solutions to improve stormwater quality; and
  - improving the collection of pollution before water enters the Alexandra Canal

Government programs including backlog sewer and the Metropolitan Water Plan

- The Price Review is taking place in a climate of considerable debate about strategies to manage Sydney's water supply/demand balance in both the short and longer term. Sydney Water welcomes the NSW Government's Metropolitan Water Plan, which identifies a range of demand and supply measures to secure long-term water supplies for the Sydney region which include:
  - contribution to the Metropolitan Water Strategy's Demand Management Fund;
  - a desalination study; and
  - reducing leakage from its system by approximately 25 per cent to make better use of scarce water.
- Over the four year period Sydney Water will also extend sewerage services to towns listed in the Priority Sewerage Program–Stage 1, comprising a new sewage treatment plant and 180 kilometres of mains and wastewater services.

Business Efficiency

- To minimise some of the impact of the increased expenditure over the period Sydney Water is implementing a range of programs to increase business efficiency including:
  - developing management information systems for field and office staff;
  - constructing 40 new rechlorination plants within the water supply system to replace manual dosing;
  - implementing energy efficiency projects; and
  - rationalising depots and office sites and reducing corporate overheads.

16 To meet the expenditures outlined above, and ensure a commercial return on the community's investment, Sydney Water requires revenue of $1.55 billion in 2005/06, rising to $1.67 billion in real terms by 2008/09.[4]

PRICES

17 The current drought has increased attention on the importance of setting fully cost reflective prices to:

- send a strong signal to conserve water;
- send a signal to reduce discretionary water usage in the residential sector (eg. outdoor use);
- provide an incentive for buying water efficient appliances; and
- provide an incentive for switching to other forms of water (eg. recycled water).

18 Sydney Water supports the Tribunal's recommendation to encourage efficient water use by increasing the proportion of total monies raised through usage based charges. This could be achieved through a larger usage component or an inclining block tariff.

19 The recently announced Metropolitan Water Plan provides a plan for augmenting supply and encouraging more efficient use of water. Increased emphasis on the pay for use component of pricing complements the supply augmentation and water conservation initiatives set out in the Plan.

20 In order to encourage water conservation, the proportion of water charges recovered through the usage based price has increased over time from a low base. In 1993 the average water usage price was $0.58 per kilolitre in real terms, compared to the $1 per kilolitre water usage price paid by customers today. Over that time customers have adjusted their consumption

[4] These revenue requirements are consistent with the phased price increases described in paragraph 22 of this Executive Summary.

patterns in response to the changing structure of water prices. The proposed changes represent a further step to ensure that customers can respond to the true value of Sydney's scarce water resources.

21 Overall, Sydney Water's submission notes an underlying average real price increase of 3.2 per cent each year for four years is required to ensure the efficient delivery of water services, secure investment for future years and to send a strong water conservation signal to water users.[5] Sydney Water will spend a total of $837 million over the next four years delivering the investment to meet its urban growth requirements alone.

22 Sydney Water's submission notes an underlying average real price increase of 3.2 per cent each year for four years is necessary to fund:

- Sydney Water's extensive capital works and maintenance program over the next four years (representing 2.4 per cent); and
- The projects outlined in the NSW Government's Metropolitan Water Plan (representing 0.8 per cent).

23 In addition, the final price outcome will be influenced by the Tribunal's decision on the appropriate recovery of the cost of capital tied up in the provision of Sydney Water services. The appropriate return on the asset base is rightly a matter for the Tribunal to determine, as it does for other monopoly services. In June 2004, the Tribunal determined a WACC range of 6.1 to 7.5 per cent for the NSW electricity distributors. The Independent Competition and Regulatory Commission in Canberra supported this position in its recent decisions, which applied a common WACC estimate (7.0 per cent real pre-tax) to both ACTEW and AGL's electricity and water businesses. World-wide, it is acknowledged that recovery of the cost of capital invested is essential to preserve the operating capacity of utilities and ensure their ongoing financial viability.

24 To illustrate possible outcomes, Sydney Water has modelled the financial and customer impacts of its proposed price path based on a 6.5 per cent WACC estimate. Sydney Water believes that it would be reasonable to achieve this rate sequentially by 2008/09.

25 Such an outcome would mean that in total, real charges would rise at an annual average rate of 4.6 per cent over each of the next four years.

26 For efficiency and fairness all customers need to pay for the costs they incur. However, Sydney Water recognises that it may be appopriate to phase a transition to a more efficient and fair pricing system over time. While delaying customer reponse to changes in the prices signals, this ensures people have time to respond to the structure and level of prices. Sydney Water therefore suggests that prices do not immediately move to full cost recovery, but recognising the drought and the need to send strong demand management signals, charges increase by 7 per cent in real terms in 2005/06 and 3.8 per cent for each of the following three years.

27 Sydney Water believes that in order to conserve water this charging increase should be achieved by increasing the usage charge component, and not the fixed component of the bill. It is therefore proposed to raise the price per kilolitre for water from $1.00 to around $1.40 over the next four years.[6] Under the increased usage charge option (assuming no reduction in consumption) the total average residential customer's bill would increase by an average of 60 cents per week each year ($31 per year) in real terms. This would result in an overall increase of $124 (in real terms) on the total bill by 2008/09. As discussed in this submission and in the Tribunal's June 2004 review of price structure reform in Sydney this base water price increase could be complemented by a stepped price increase for residential water use above 100 kilolitres a quarter of $1.80. This would send a further water conservation signal to around 20 per cent of residential customers (more in summer) who generally use more than 100 kilolitres a quarter.

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5 Inflation would add around 2.5 per cent per year to this price increase.

6 For an average consumer using 250 kilolitres per year.

28 Sydney Water believes these price increases are necessary in the context of the severe and ongoing drought and projected population growth in Sydney, to ensure customers receive appropriate signals about the true cost of water in both the short term and long term. These price increases should also be viewed in the context of the historical reductions in water and sewer charges in Sydney over the last ten years.

MANAGING CUSTOMER IMPACTS

29 Sydney Water currently offers a number of programs to help households in financial hardship reduce their overall water consumption and/or pay their Sydney Water account. These comprehensive safety nets will assist customers in managing the price changes outlined above. These initiatives are:

- **residential retrofits** to ensure water is used efficiently by Sydney Water customers. Retrofits are provided to customers at a subsidised rate.[7] Retrofits provide savings of around 21 kilolitres a year for an average sized family, representing a saving of approximately 7 per cent off the water usage bill (3 per cent off the total bill) and 5 per cent off the energy bill each year;
- Sydney Water administers water and sewage **rebates to pensioners**.[8] In 2003/04 Sydney Water issued rebates to approximately 215,000 pensioners of $334 per annum on average, comprising 100 per cent of the water service charge and 74 per cent of the sewer service charge. This NSW Government funded rebate is the most generous pensioner rebate in Australia;
- Sydney Water offers **extended payment arrangements** to customers who cannot pay their accounts. To obtain this arrangement, customers must contact Sydney Water to arrange a deferred payment date or an instalment plan; and
- the Sydney Water **Payment Assistance Scheme** allows participating welfare agencies to issue $25 vouchers to residential customers requiring hardship relief for payment of their Sydney Water account.

30 In addition to these comprehensive safety nets Sydney Water believes further assistance could be provided to large, low-income households consuming relatively large amounts of water for essential household uses. Sydney Water proposes targeted initiatives to assist these customers that will provide the dual benefit of reducing water consumption and mitigating the impacts of price structure change on household disposable income:

- **targeted residential retrofits:** Sydney Water will actively target high water consuming households under the residential retrofit program, focusing on low-income households, vulnerable large families and tenants. For a seven-person household consuming in excess of 100 kilolitres per quarter, a residential retrofit is expected to provide annual water savings of greater than 34 kilolitres, energy savings of around $48 each year and water savings of around $48 in real terms each year by 2008/09.[9] Furthermore, the residential retrofit program will be offered free of charge to households assessed by accredited welfare agencies as being in financial hardship; and
- **assistance with purchase of water efficient appliances:** Sydney Water will contribute to a selected accredited program that works with households in financial hardship to purchase accredited water efficient appliances. For a seven-person household, the

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7 Residential retrofits are provided free to holders of a Centrelink Health Care Card, Pensioner Concession Card and Department of Veterans' Affairs Gold Card and are available to all other households at the subsidised rate of $22. The average Sydney Water operating cost of each retrofit is $130 per household.

8 The program is available to pensioners on Age, Disability Support and Service pensions and holders of a Pensioner Concession Card, Department of Veterans' Affairs Gold Card embossed with TPI/TTI or war widow/widower or Extreme Disablement Adjustment. The rebates apply to houses and home units (strata or company title) that are owned and occupied by an eligible customer. Eligible customers may also be entitled to a rebate if they are occupants of a retirement village on a long-term lease arrangement.

9 These savings are based on the increased usage charge option (see Section 7.2.9).

annual water savings associated with a AAAA washing machine is approximately 37 kilolitres with the annual real dollar savings on the water bill of $52 by 2008/09.[10]

31 In addition, if a decision was made to introduce an inclining block tariff for large domestic consumers, provision could be made for large families to receive a rebate on their total water and sewer bill to offset the impact of the higher cost of water use above 100 kilolitres per quarter. This rebate would apply for water used up to 125 kilolitres per quarter and would be valued at up to $71.50 in the first year. The rebate could apply for a period up to the duration of the Determination.

32 Two additional safety nets being proposed to assist vulnerable customers are:

- **increasing Payment Assistance Scheme availability to tenants** to provide tenants with access to assistance equal to property owners; and
- **adjusting the pensioner rebate** to continue to provide protection for pensioners.

CONCLUSION

33 Sydney Water realises it is in a responsible position in relation to environmental and social outcomes, and welcomes scrutiny through the Price Review process. The Tribunal is required to balance a number of competing objectives in setting prices for Sydney Water's water, wastewater and stormwater services. This submission attempts to assist the Tribunal find this balance. Sydney Water looks forward to working with the Tribunal as it undertakes its deliberations.

[10] These savings are based on the increased usage charge option (see Section 7.2.9).

1 Introduction

Sydney Water Corporation (Sydney Water) is pleased to present this submission to the Independent Pricing and Regulatory Tribunal (the Tribunal) in response to its Review of Metropolitan Water Agency Prices Issues Paper (the Issues Paper). [11]

1.1 CONTEXT

This Review of Metropolitan Water Agency Prices (the Price Review) takes place in a climate of considerable debate regarding strategies for managing the short and longer-term water supply/demand balance in the Sydney region. Key issues in this debate include:

- the right mix of supply and demand strategy options;
- the role of water pricing as a way of encouraging responsible water use and relieving pressure on Sydney's limited water supplies;
- the additional infrastructure required to meet the growing demand in the Sydney Basin; and
- the need to improve Sydney's water supply and reduce the environmental impacts of further growth in the Sydney region.

The recently released Metropolitan Water Plan has set out a clear path of demand management and supply augmentation steps to manage Sydney's water requirements over the next 25 years. This presents a firm basis for the Price Review to proceed.

The price caps imposed in past regulatory decisions have resulted in falling water bills (in real dollar terms). Water prices have fallen considerably since the Tribunal started regulating Sydney Water's prices in 1992/93. Revenue per property has fallen by 36.5 per cent since then, while customers' ability to pay has increased. Water bills have fallen from 1.6 per cent of average weekly earnings in 1993 to just 1.4 per cent today.

In this Price Review the challenge for the Tribunal is to establish a tariff structure that enables Sydney Water to earn revenues that allow it to recover the full cost of the services it provides including the cost of capital employed. With the current wide appreciation of water scarcity in the Sydney region, it is also an opportune time to set water prices that encourage consumers to use our limited supplies more responsibly.

1.2 TRIBUNAL CONSIDERATIONS

The incentive based regulatory framework used by the Tribunal is intended to encourage efficient behaviour by Sydney Water.

The Issues Paper highlights that in setting water prices the Tribunal is required to address a number of objectives including consumer protection, economic efficiency, financial viability and environmental protection. Where broader considerations require the Tribunal to balance economic efficiency considerations with other considerations, such as fairness and equity, then these trade-offs must be made on a clear and transparent basis.

In the Issues Paper the Tribunal recognises that the Price Review takes place at a time of considerable community attention on water supply issues. The need to get the right balance between water supply and growing water demand has been emphasised by the recent widespread drought across Eastern Australia. However, as the Tribunal correctly observes, it is important to distinguish between the more immediate (albeit significant) problems induced by the drought and the underlying and longer-term trends that are driven by factors such as population growth and economic development.

Sydney Water supports the Tribunal's attention to this issue. This submission comments on the centrality of the structure and level of water pricing to encouraging more responsible use of water to relieve pressure on existing supplies. At the same time, noting that enlarging the

[11] The Tribunal, *Review of Metropolitan Water Agency Prices, Issues Paper*, June 2004.

proportion of usage based charges increases the volatility of its revenue, Sydney Water proposes mechanisms to manage this risk.

1.3 POLICY CONTEXT

The 2005 Price Review coincides with intense discussion and debate regarding a number of issues that are critical in shaping the future of the water industry in this State. These issues and the implications for the Price Review are discussed below.

1.3.1 Metropolitan Water Plan

The NSW Government has recently released its Metropolitan Water Plan.[12] This comprehensive response to water supply and demand management describes the NSW Government's approach:

- to managing the immediate consequences of the current drought;
- to meeting longer-term community requirements for water security; and
- how broader environmental goals will be met, including improved water flows in the Hawkesbury – Nepean River.

The Metropolitan Water Plan recommends a range of demand reduction and supply augmentation measures involving Sydney Water, the Sydney Catchment Authority (SCA) and other organisations. Through the Metropolitan Water Plan Sydney Water is responsible for:

- the continuation of existing programs such as:
  - residential and public housing retrofits;
  - rainwater tank rebates;
  - the *Every Drop Counts Business Program*;
  - school education and rain tank rebates;
  - the BlueScope Steel recycling scheme;
  - expansion of the Rouse Hill recycled water scheme; and
  - Sydney Water's substantial leakage reduction program;
- new programs under investigation or development including the:
  - pressure management program;
  - desalination feasibility study;
  - multi unit metering;
  - recycling plants at North Head and Malabar sewage treatment plants; and
  - a recycled water supply to new homes in the Hoxton Park development area.

Sydney Water will also assist other State Government agencies in implementing initiatives under the Metropolitan Water Plan including:

- pricing/tariff restructuring;
- appliance labelling and standards;
- the demand management fund; and
- BASIX.

The initiatives under the Metropolitan Water Plan that the SCA is responsible for undertaking, which impact on this submission, are:

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[12] NSW Government, *Meeting the challenges – Securing Sydney's water future* (Metropolitan Water Plan), October 2004.

- **Shoalhaven transfers**: the SCA is to undertake detailed planning and consultation for increasing transfers from the Shoalhaven River. Construction of stage 1 is expected to start early 2006 and be finished in 2009. The capital costs for stage 1 are estimated to be between $244 million and $280 million and operating costs between $3.6 million and $4.2 million. Stage 1 is expected to supply an extra 50-80 gigalitres (GL) a year. Stage 2 is yet to be approved;
- **deep storages**: the relocation of pipes and pumps to access water in Avon, Nepean and Warragamba Dams that is currently inaccessible. This project is expected to have capital costs of $106 million and operating costs of $0.65 million;
- **groundwater**: trials to test the viability of groundwater for drought relief. Investigations will cost approximately $4 million and capital costs will be approximately $8 million. A $0.55 million operating cost is expected if the option proceeds;

Sydney Water welcomes these actions for managing the supply/demand balance. It is important to build on the base established by the Metropolitan Water Plan to ensure prices reflect the true cost of Sydney's scarce water resources.

In this submission Sydney Water's capital and operating expenditure estimates and demand forecasts include the initiatives outlined in the Metropolitan Water Plan. Sydney Water has liaised with the SCA to ensure that Sydney Water's estimate of the SCA's costs takes into account the initiatives outlined in the Metropolitan Water Plan.

The Metropolitan Water Plan initiatives account for around 15 per cent of the price increase required over the next four years (the Determination period). The majority of the increase is driven by Sydney Water's additional capital and operating expenditure required to meet service standards, including maintaining and renewing existing assets and developing new assets to meet growth (around 55 per cent of the price increase) and recovering the capital cost of the past community's investment in Sydney Water's assets (around 30 per cent of the price increase).

1.3.2 Sewer overflow abatement

Sewer overflow abatement is regulated via environmental protection licences issued by the Department of Environment and Conservation (DEC) for Sydney Water's sewage treatment systems. Sydney Water and DEC have been considering how best to resolve wet and dry weather sewage overflow issues in relation to these licences.

Sydney Water's capital and operating expenditure forecasts reflect Sydney Water's estimate of the most efficient approach to meeting the overflow abatement requirements. Sydney Water currently expects to spend $168 million on overflow abatement over the Determination period. However, requirements may vary significantly depending on the final agreement reached.

Sydney Water, in consultation with DEC, intends to present an integrated strategy on overflow abatement for Government consideration in 2005. Sydney Water has identified the potential for a supplementary submission to the Tribunal prior to December 2004 as negotiations with DEC are finalised.

In this submission Sydney Water endeavours to quantify the potential range of cost impacts of the proposed overflow abatement program.

1.3.3 Growth

Over the last five years Sydney has experienced the strongest sustained period of growth since the 1960s. Current DIPNR population projections indicate that this growth will continue. By 2011 the population of Sydney is forecast to increase to about 4.5 million from its present level of almost 4.2 million. Together with a continuing decline in average household size, this means an additional 125,000 dwellings will be developed from 2005/06 to 2008/09. With an increasing proportion of new dwellings being built in greenfield areas, the development of new infrastructure is significantly more expensive than servicing 'infill' growth.

Sydney Water is planning to spend $837 million over the next four years servicing this development. The sequence and timing of land releases is yet to be announced and may alter Sydney Water's growth investment requirements over the Determination period.

1.3.4 Price structure review

The Tribunal has recently published the Final Report of its investigation into price structures for both retail and wholesale water prices.[13] The Tribunal concluded that a tariff structure involving an inclining block, or two-tiered variable usage charge, and a lower fixed access charge was likely to be the most suitable price structure for Sydney. Sydney Water supports a move to a larger usage charge component for conservation reasons, however:

- the demand response to a change in price structure is difficult to accurately estimate; and
- a move to a larger usage charge component will increase the volatility of Sydney Water's revenue and expose the organisation to additional financial risk.

Sydney Water supports the Tribunal's proposals to place greater emphasis on usage based water prices to ensure customers face strong signals in relation to the value of the water they consume. However, Sydney Water believes that effectively managing revenue uncertainty (discussed in Section 3.3.3) is critical to the introduction of higher usage charges.

1.3.5 Access issues

Another key aspect of Sydney Water's policy environment relates to the potential application of Part IIIA of the *Trade Practices Act 1974*. The importance of this issue has been highlighted by the recent draft recommendation of the National Competition Council (the Council) to declare services provided by Sydney Water.[14]

This recommendation is in addition to the rights third parties currently possess to obtain access to raw effluent from Sydney Water's system for 'sewer mining'.[15]

In its draft recommendation the Council determined that a number of services should be declared relating to interconnection and transportation services for a period of 15 years. Submissions on the draft recommendation are due by 5 November 2004 and a final recommendation may be completed by December 2004.

While it is outside the scope of this submission to comment in detail on the Council's draft recommendation, these considerations are not independent from the Price Review. Revenue from water, wastewater and stormwater services provided by Sydney Water are dependent on usage. Depending on the Council's final decision, Sydney Water might be exposed to the greater risk of competition for its customers and services. It is not entirely clear that the current regulatory arrangements governing prices are readily able to accommodate the environment contemplated by the Council. Sydney Water may need greater price flexibility to respond to the new market conditions created by the potential regime recommended by the Council.

In the absence of a clear understanding of the outcomes of the Council deliberations on this matter, this submission to the Tribunal has been prepared on a 'business as usual' basis. Sydney Water notes that further consideration may be required depending on the Council's final decision.

1.4 STRUCTURE OF SUBMISSION

This submission presents Sydney Water's response to the Tribunal's Issues Paper. Sydney Water's submission sets out a clear case justifying its expenditure requirements over the Determination period on the basis of efficient operations and capital works, and describing the improved security and service standards to be delivered through this expenditure. It is argued that prices should be based on the true cost of providing services, including an appropriate return on capital. Support is given to tariff restructuring to increase emphasis on pay by use to

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13 Independent Pricing and Regulatory Tribunal, *Investigation into Price Structures to Reduce the Demand for Water in the Sydney Basin, Final Report*, July 2004 (Tribunal Final Report).

14 National Competition Council, *Application by Services Sydney for Declaration of Sewage Transmission and Interconnection Services provided by Sydney Water: Draft Recommendation*, 12 August 2004.

15 Sewer mining involves the extraction of raw effluent from a reticulation network, generally for the purpose of treatment and use of the recycled wastewater.

encourage efficient consumption of water. Independent external studies show that Sydney Water has achieved strong economic performance outcomes in the recent past, including periods of strong productivity growth. Sydney Water, however, recognises the need to further improve in a number of areas. This submission draws the Tribunal's attention to the steps Sydney Water is taking to further improve economic performance.

The submission is structured as follows:

- Section 2 provides some background on Sydney Water and the service obligations that arise from Sydney Water's legislative and regulatory obligations. It discusses Sydney Water's approach to managing its assets effectively and efficiently in light of these requirements. This section also discusses the key challenges faced by Sydney Water in the context of the Price Review;
- Section 3 discusses the regulatory context for the Price Review. It considers the aims of performance based regulation in light of the current supply-demand concerns;
- Section 4 discusses Sydney Water's economic performance in the context of appropriate measurement mechanisms;
- Section 5 considers Sydney Water's performance relating to prices for Sydney Water's core, trade waste and miscellaneous services over the period of the Tribunal's previous Determination No. 4 for the period 1 July 2003 to 30 June 2005;
- Section 6 considers each of the key building blocks used to estimate Sydney Water's revenue entitlement. It provides the Tribunal with the information and evidence required to estimate a sustainable revenue path for Sydney Water from 2005/06, and presents Sydney Water's estimated revenue needs;
- Section 7 discusses the appropriate structure of water prices and considers the impact of alternate water prices on customers and appropriate mitigation measure to manage impacts on vulnerable customers; and
- Section 8 discusses other charges, including trade waste, recycled water charges and miscellaneous charges and outlines proposals for tariff rationalisation to streamline Sydney Water's complex legacy tariff structure.

More detailed information is provided in a number of appendices attached as a separate document:

- Appendix A presents evidence on Sydney Water's economic performance;
- Appendix B discusses progress on a number of matters raised by the Tribunal at the previous Determination and in the Issues Paper;
- Appendix C considers the key uncertainties associated with Sydney Water's capital expenditure forecasts;
- Appendix D discusses Sydney Water's stormwater assets and prices;
- Appendix E presents Sydney Water's proposed trade waste charges;
- Appendix F discusses miscellaneous charges and late payment fees;
- Appendix G outlines the reasoning and impact of the proposed tariff rationalisation;
- Appendix H presents the price schedules; and
- Appendix I outlines the range of customer and price impacts as a result of the Tribunal's decision on an appropriate rate of return.

All dollar values reported in this submission are in 2004/05 dollars, unless otherwise stated.

2 Sydney Water

This section provides some background on Sydney Water (Section 2.1), before outlining Sydney Water's service obligations arising from the *Sydney Water Act*, licence conditions, customer contracts and regulatory requirements (Section 2.2). Section 2.3 presents Sydney Water's approach to managing its assets effectively and efficiently in light of its service and regulatory requirements. Section 2.4 discusses Sydney Water's key challenges.

2.1 ABOUT SYDNEY WATER

Sydney Water provides drinking water, wastewater services and some stormwater services to nearly 4.2 million people in Sydney, the Blue Mountains and the Illawarra. The area of operations is presented in Figure 1.

Sydney Water's vision is to be a successful business that protects the environment and public health through the provision of sustainable water services. To help realise this vision, Sydney Water will continue to pursue its three equal principal objectives, as set out in the *Sydney Water Act 1994*:[16]

- to be a successful business and to this end operate at least as efficiently as any comparable business, maximise the net worth of the State's investment in Sydney Water and exhibit a sense of social responsibility by having regard to the interests of the community in which it operates;
- to protect the environment by conducting its operations in compliance with the principles of Ecologically Sustainable Development; and
- to protect public health by supplying safe drinking water to its customers and other members of the public in compliance with the requirements of its Operating Licence.

To achieve these objectives Sydney Water employs around 3,400 staff, operates assets valued at about $11 billion and has an annual capital works program in excess of $500 million.

2.1.1 Water services

Sydney Water supplies more than 1.5 billion litres (1.5 GL) of water to more than 1.6 million homes and businesses each day. Sydney Water buys water from the Sydney Catchment Authority (SCA), the organisation responsible for bulk water supply in the Greater Sydney region.

Sydney Water treats the water at 10 water filtration plants in order to meet requirements of the Australian Drinking Water Guidelines. The largest plant at Prospect treats more than 80 per cent of Sydney Water's water, which comes from Warragamba Dam.

Sydney Water distributes the water via a network of 260 service reservoirs, 152 pumping stations and 20,867 kilometres (km) of water mains.

2.1.2 Wastewater services

Sydney Water collects and treats more than 1.3 billion litres (1.3 GL) of wastewater from homes and businesses and recycles more than 39 million litres of wastewater each day. The sewerage network consists of 23,014 km of sewer pipes and 656 sewage pumping stations in 28 separate sewerage systems.

Wastewater collected in the sewerage systems flows to 31 sewage treatment plants where it is treated before being reused or discharged in accordance with strict licence conditions issued by DEC.

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[16] Section 21, *Sydney Water Act* 1994.

Figure 1: Sydney Water's area of operations

Around 86 per cent of wastewater is processed at the three biggest plants at Malabar, North Head and Bondi. Water quality discharged from the plants is monitored in accordance with licence standards.

Sydney Water has a number of water recycling schemes in place that help reduce discharges of treated wastewater to the environment and reduce demand on water supplies.

2.1.3 Stormwater services

Sydney Water provides stormwater drainage facilities to approximately 450,000 homes and businesses. Sydney Water is required to maintain the hydraulic capacity of the system it owns and manages. Stormwater services are also provided by a number of councils throughout Sydney Water's service area.

Sydney Water operates 436 km of stormwater channels, mostly in the south and southwestern suburbs of Sydney. The channels help to minimise the pollution of waterways and mitigate flood risks.

Sydney Water also operates and maintains stormwater pollution control devices, with approximately 1,930 cubic metres of rubbish and 1,567 tonnes of sediment collected by gross pollutant and sediment traps in the past year.

2.2 SYDNEY WATER'S OPERATING ENVIRONMENT

Sydney Water operates in a highly regulated environment that establishes defined obligations for the organisation. Sydney Water's activities are directly affected by 62 pieces of legislation, 27 Environment Protection Licences, its Operating Licence and its Customer Contract. The key instruments used to regulate Sydney Water are summarised in Table 1 and discussed in more detail below.

Table 1: Regulators of Sydney Water's business

Performance area	Instrument	Regulator
Prices	Pricing Determination	The Tribunal
Customer service	Operating Licence Customer Contract	The Tribunal
Environmental performance of wastewater systems	Environment Protection Licences	DEC
Drinking water quality and system requirements	Operating Licence Memorandum of Understanding Australian Drinking Water Guidelines 1996	NSW Health
Stormwater management	Stormwater Environmental Improvement Program	DEC
Planning	Approvals Water Allocation	DIPNR
Water extraction	Water Extraction Licences	DIPNR via SCA

2.2.1 Regulatory obligations

Sydney Water's Operating Licence, issued under Section 12 of the *Sydney Water Act*, regulates the manner in which Sydney Water provides, constructs, operates, manages or maintains systems or services for:

- storing or supplying water;
- providing sewerage services;
- providing stormwater drainage systems; and
- disposing of wastewater.

The Operating Licence requires Sydney Water to provide these services within metropolitan Sydney, Illawarra and the Blue Mountains. There are penalties payable under Section 19 of the *Sydney Water Act* for contravention of the Operating Licence. There is an annual independent audit of Sydney Water's Operating Licence, commissioned by the Tribunal.

Section 55 of the *Sydney Water Act* establishes the Customer Contract, which sets out the relationship between Sydney Water and its customers. The Tribunal makes recommendations to Government about the terms and conditions of the Customer Contract when it is reviewed as a schedule to Sydney Water's Operating Licence.

In addition to the strict regulatory parameters imposed by the *Sydney Water Act*, the Operating Licence and the Customer Contract, the services supplied by Sydney Water are regulated specifically by a number of Acts and regulations, including:

- *Protection of the Environment Operations Act 1997* (NSW) which establishes general environmental offences and prosecution provisions, and under which environmental protection licences are issued by DEC;
- *Public Health Act 1991* (NSW) which charges NSW Health with protecting public health, including safe drinking water;
- *Environmental Planning and Assessment Act 1979* (NSW) which charges DIPNR with oversighting approvals for urban development; and
- *Heritage Act 1977* (NSW) which charges DEC with protecting NSW's cultural heritage.

Sydney Water is also required to comply with the terms and conditions of various licences. In some circumstances, a breach of those licence conditions constitutes a strict liability offence and limited defences apply.

2.2.2 Price regulation

Under Section 4 of the *Independent Pricing and Regulatory Tribunal Act 1992* the Tribunal has pricing responsibility for services declared to be government monopoly services. Consequently, the majority of Sydney Water's revenue is regulated by the Tribunal, including:[17]

- water services;
- sewerage services;
- stormwater drainage services;
- trade waste services;
- services supplied in connection with the provision or upgrading of water supply, sewerage facilities and, if required, drainage facilities for new developments;
- ancillary and miscellaneous customer services for which no alternative supply exists and which relate to the supply of services referred to in the paragraphs above; and
- other water supply, sewerage and drainage services for which no alternative supply exists.

In addition, the bulk water services supplied to Sydney Water by the SCA were declared as government monopoly services in 1999.[18]

2.2.3 Governance

The *Sydney Water Act* and the *State Owned Corporations Act 1989* (NSW) provide Sydney Water's framework of corporate governance. Under this legislative framework, all decisions relating to Sydney Water's operations are made by or under the authority of its Board of Directors. In turn, the Board is accountable to the NSW Government through a Portfolio Minister and two Shareholder Ministers.

The *Sydney Water Act* and the Sydney Water Constitution govern the composition of the Board of Directors, as well as appointments to it. The Board may consist of up to 10 members, with the Chairman and Directors appointed by the Shareholder Ministers. The Managing Director is responsible for the day-to-day management of Sydney Water's

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[17] Particular services supplied by the Water Board (Sydney Water's predecessor) were declared to be government monopoly services in 1992 (The Tribunal (Water, Sewerage and Drainage Services) Order 1992 (Gazette No. 105, 28 August 1992, page 6430)). Sydney Water's services were declared to be government monopoly services in 1997 (The Tribunal (Water, Sewerage and Drainage Services) Order 1997 (Gazette No. 18, 14 February 1997, page 558)).

[18] Independent Pricing and Regulatory Tribunal (Water Supply Services) Order 1999 (Gazette No. 95, 20 August 1999, page 6136).

operations in accordance with the general policies and specific directions of the Board. The Managing Director delegates his powers and functions to Sydney Water employees.

2.2.4 Recent developments

Sydney Water's operating environment is continuing to evolve over time. In the period since the previous Determination, Sydney Water has been participating in the end-term review of its Operating Licence and the renewal of its 28 sewage transport system licences. These reviews are currently underway with these licences to be renewed by 1 July 2005 when the next Determination period is to commence.

The *Sydney Water Catchment Management Act 1998* has been reviewed with the report currently with the Minister for the Environment and both the water sharing plan and water licensing requirements of the *Water Management Act 2000* have now been commenced, as contemplated by Parliament. These requirements will be applied to Sydney Water as part of the Government's implementation of the Metropolitan Water Plan. Sydney Water's Regulations will also be subject to statutory review in 2005, with important issues for consideration being water restrictions and plumbing and drainage regulations.

The Government has also implemented its Natural Resources Management Reform, which established 13 Catchment Management Authorities in NSW to coordinate natural resource management on a catchment basis, including potentially, stormwater in metropolitan Sydney. It also established the Natural Resources Commission, which is to eventually set natural resource management standards for water quality, salinity, soil and biodiversity, which may have implications for Sydney's water services.

At a national level, the Council of Australian Governments (COAG) has developed a National Water Initiative (NWI) as the next stage of its 1994 Strategic Agenda on Water Reform. Amongst other things, the NWI intends to address best practice water pricing, including for recycled water services, and specify urban water reform outcomes regarding leakage reduction, recycling and water efficiency, all of which have important future implications for Sydney Water. The NWI has also resulted in the establishment of a National Water Commission, which will advise COAG on the State's compliance with its NWI commitments, including for urban water reforms.

The Government's Metropolitan Water Plan, which will address water supply issues for greater Sydney over the next 25 years, represents the most important current policy initiative that will apply to Sydney Water over the next four years.

2.3 SYDNEY WATER'S APPROACH TO PLANNING AND RESOURCE ALLOCATION

2.3.1 Introduction

Sydney Water is a large and complex business involving the delivery of many different types of (essential) services to a large and growing population. Sydney Water supplies these services in an environment where new supply options are limited and where customers demand ever increasing standards of product and service quality. At the same time, Sydney Water is being asked by the Tribunal, acting as an agent of customers, to meet these challenges at progressively lower costs over time, while also ensuring that the value of the community's investment is at least maintained, if not improved.

The only way that these goals can be simultaneously achieved is by ensuring Sydney Water secures efficiency gains on a continuous basis. As an asset based business, a key source of efficiency flows from an effective resource planning and management process. This process forms the basis for the delivery of efficient capital and operating expenditures presented in Section 6.

This section describes Sydney Water's resource planning and management process, known as the Business Planning Framework (BPF). The BPF provides a systematic and robust basis for making informed decisions about how much to spend on what part of the business and when. It also provides a mechanism for monitoring Sydney Water's performance against targets, and incorporating this information into future decisions.

Sydney Water has been undertaking many elements of the BPF over the period since the previous Determination. More recently, Sydney Water has been building on the existing business planning systems and processes to implement a more coherent, structured BPF to apply consistently across the whole organisation, involving:

- a standardised approach to asset management and business planning;
- greater clarity about the basis for decision making, and accountability for outcomes; and
- a governance framework centred around the operation of the Financial Performance and Review Committee (FPRC). The FPRC is chaired by the Managing Director and is responsible for reviewing and monitoring expenditures and leading the progressive development and implementation of the BPF. From August 2004 the FPRC is meeting monthly to:
    - *establish policy* in accordance with corporate direction, and *ensure compliance* with such policies and associated processes;
    - *prioritise expenditure* across Sydney Water divisions in response to changing strategic or operational needs;
    - *monitor* expenditures and the progress of the business reform strategies across the organisation; and
    - approve/endorse business cases for large individual projects and programs.

While the BPF is in its early stages, it is already producing more efficient practices within the organisation. Sydney Water is confident that it will provide an effective basis for its program of continuous improvement. Once fully implemented, the BPF will provide a structure within which all Sydney Water's expenditure plans will be formed, evaluated and decided. To streamline the implementation of the BPF, responsibility for business planning has moved to the Finance Division where it will report to the newly created position of Corporate Financial Controller along with Management Accounting, Investment Analysis and the divisional finance managers. This change has been made to better integrate planning, budgeting, monitoring and reporting.

As an asset focussed business Sydney Water's asset management planning process forms an important part of the BPF. Sydney Water's approach to asset management planning is described in more detail below and in Section 5.3.3, where Sydney Water responds to some of the matters raised in the previous Determination.

Sydney Water's BPF involves six major (sequential) steps:

1. Defining the services and service performance levels that Sydney Water must provide;
2. Determining the most appropriate set of resources and business configuration to meet the identified customer and stakeholder needs;
3. Developing budgets to support the acquisition of the required resources and operation of the business;
4. Acquiring and applying resources in the most appropriate way to efficiently deliver the required service outcomes;
5. Monitoring the performance of expenditures and performance outcomes against regulatory and internal targets, and if necessary adjusting the allocation of expenditure throughout the year; and
6. Reporting and applying the results of the monitoring to inform future investment decisions.

This high level BPF is illustrated in Figure 2. Each of these key steps is discussed in more detail below.

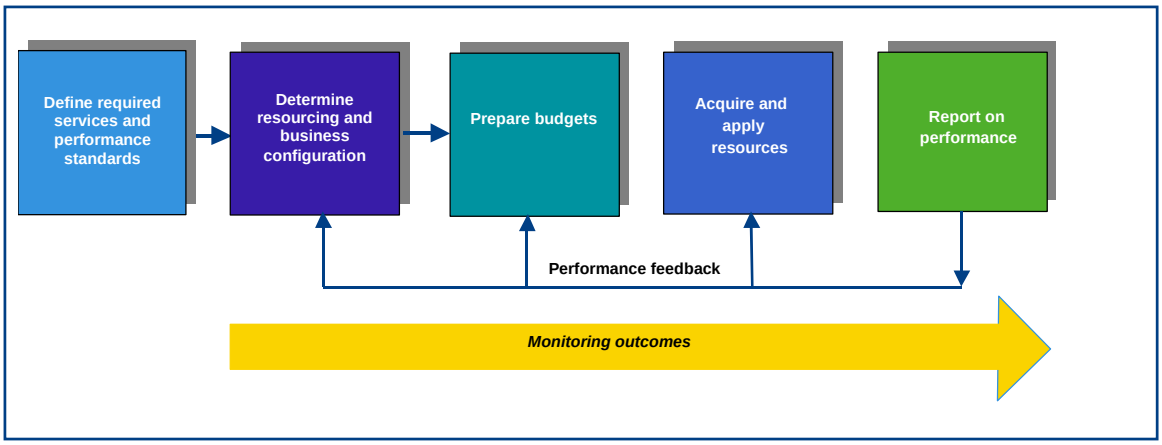

Figure 2: Overall Business Planning Framework

(1) Define required services and service performance levels

The starting point in any business planning process is understanding the needs of the market – that is, what customers want. In Sydney Water's case its regulatory obligations provide the starting point for defining the required services and performance levels. However, given the nature of Sydney Water's business, the organisation must also consider the requirements of other stakeholders, such as regulators and shareholders.

The quantity and nature of services provided by Sydney Water is driven by four key factors:

- regulation;
- Government policy directives;
- customer expectations; and
- shareholder expectations.

These business drivers are briefly discussed in turn below.

Regulation

As described in Section 2.2, Sydney Water's operations are governed by a wide array of regulatory mechanisms administered by a large number of agencies. These regulations and associated agencies govern, directly and indirectly:

- the manner in which Sydney Water provides services;
- the nature of the services that it provides;
- when it must provide these services; and
- how it can recover its costs.

Virtually every aspect of Sydney Water's business is affected, to a varying degree, by regulation. A key challenge for Sydney Water is to be able to define a set of water, sewerage and drainage services that simultaneously satisfy all of the regulatory requirements while obtaining a commercial rate of return on its assets.

Government policy

Government policy has a bearing on determining the nature and scope of Sydney Water's operations and this in turn will influence Sydney Water's costs. There are several ways that Government policy affects Sydney Water:

- through changes in specified regulatory obligations such as licence conditions;
- through broader policy decisions that have implications for Sydney Water's actions, for example, decisions in relation to growth;
- seeking specific actions, for example, the Priority Sewerage Program (PSP); and
- through the Government's response to emerging issues, for example, through the imposition of water restrictions as a result of the drought.

Customer expectations

There are three key dimensions to customer service standards:

- reliability of service, for example, continuity of supply;
- quality of the product, for example, the quality of potable water, the level of treatment of discharges, sewer breaks; and
- quality of related customer services, for example, the responsiveness to customer service requests, enquiries and complaints.

Sydney Water relies on a range of communication channels for determining the needs of its customers and gauging their attitudes to Sydney Water's services and service levels. These include:

- surveys of customers, which are conducted regularly. Annual and ongoing research is conducted including surveys of residential and commercial customers, and emergency contact surveys. Other research, such as analysis to support specific capital works projects, customer communication and education and business initiatives are conducted on an 'as needs' basis;
- surveys of customer services provided by other water businesses domestically and internationally; and
- feedback from a range of stakeholders including:
    - customer bodies; for example, the Customer Council and the Public Interest Advocacy Centre (PIAC);
    - regular customer surveys; and
    - liaison with, and directives from, the various agencies regulating Sydney Water.

Sydney Water monitors and reports on its outcomes against the service standards developed.[19] It is also working with the Tribunal to confirm its current system of performance standards under its Operating Licence and to consider inclusion of new water conservation targets and service quality indicators in its Licence. Sydney Water has also prepared a range of reports on customer preferences for water conservation and price reform as an input to the Tribunal's review.[20]

Shareholder expectations

As a State Owned Corporation, Sydney Water is a custodian of the community's investment in water infrastructure. In this capacity Sydney Water is obliged to ensure the business is run as efficiently as possible, to keep costs low, but at the same time ensure that the community's investment is earning a sensible, commercial return. This return is an integral part of the cost recovery success for all enterprises. If Sydney Water does not earn a commercial return for the community's investment it is not recovering the full cost of its services. In such circumstances society is likely to be better off investing their limited resources in other, higher valued uses.

Defining service obligations

To the greatest extent possible Sydney Water seeks to specify its service obligations in clear and unambiguous terms. In many cases, the standards are specified in tangible, measurable

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[19] Sydney Water has recently provided the Tribunal with a comprehensive report on the organisation's compliance with its Operating Licence (Sydney Water, *Operating Licence: Compliance Report, 1 July 2003-30 June 2004*).

[20] Sydney Water has prepared a range of reports on customer preferences for water conservation and price reform as an input to the Tribunal's review.

- Sydney Water and SCA, *Community views on sustainable water resources*, July 2003.
- WSAA, Sydney Water and SCA, *Pricing for Demand Management*, December 2003.
- Sydney Water, *High water user values study*, March 2004.
- Sydney Water and SCA, *Community views on water restrictions and water conservation, including price reform*, July 2004.

terms that relate directly to physical performance of Sydney Water infrastructure. For example, Sydney Water is required to keep nutrient levels in discharges into the Hawkesbury – Nepean within specified concentration limits. Nutrient levels in discharges are a direct result of plant capacity and process characteristics.

In other cases, however, the standards have a less direct, often-complex relationship with the physical infrastructure or system performance. For example, the achievement of performance standards such as those relating to the number of customer service disruptions are influenced by a complex interaction between a number of factors including, for example, levels of maintenance, hydraulic conditions, water pressure and soil moisture. In these cases, sophisticated modelling tools are being used to predict the link between process inputs and customer service outcomes. This is discussed in more detail below.

(2) Determine resourcing and product and service responses

The business drivers dictate the level and nature of services that create a variety of obligations or service requirements. It is Sydney Water's responsibility to assemble the requirements and then interpret and prioritise these drivers in a way that maximises outcomes while minimising costs.

Defining the appropriate resources required to meet customer needs is perhaps the most involved and, hence, difficult phase of the BPF. This step incorporates:

- Definition of options to meet service requirements including:
  - modelling to assess the link between process inputs and service outcomes;
  - a whole of business planning framework;
  - asset management planning processes; and
  - a structured risk management framework; and
- Evaluation of options to meet service requirements.

Modelling the link between process inputs and service outcomes

Complex modelling and statistical analysis are used and are being further developed by Sydney Water to more accurately define and predict the link between process inputs and specific customer service outcomes. These tools and processes include various forms of hydraulic modelling, improved maintenance cost recording and life cycle costing analysis, improved condition measurement and prediction, etc. These techniques are greatly improving the quality of decision making and are enabling Sydney Water to more accurately determine least-cost solutions to deliver required service outcomes. For example, advanced modelling techniques are being applied to assist in better targeting renewals and reliability work, delivering considerable cost savings.

Whole of business planning framework

Asset related investment decisions made by Sydney Water in the past have largely been made at a project level and justified on an individual business case basis, with limited regard to the interaction with other aspects of the business or other projects. Over the past 10 years this approach has been replaced with a more solid, holistic planning framework. For example, significant effort has been made to develop a strategic context and framework for these decisions. Investment plans are now assessed from a 'whole of business' perspective. This has been particularly the case for wastewater activities in direct response to significant community and regulatory concerns about the impact of Sydney Water's operations on beaches, rivers and harbours.

The whole of business planning approach is supported and facilitated by the FPRC as described above.

Asset management planning

Asset management planning is crucial to defining, in both technical and economic terms, the set of options that best meet the needs of Sydney Water's customers. Asset management is defined within Sydney Water as a business discipline for managing the life cycle of assets to achieve a desired level of service and financial return within an acceptable risk framework.

Sydney Water aims to manage its assets to meet required service levels, minimising costs over the life of the assets. This cost minimisation has regard to the likelihood and consequences of the risks associated with asset failure. Sydney Water's asset management approach is discussed in more detail in Section 5.3.3.

The application of standardised asset management principles for each major asset or asset class in Sydney Water is evident in specific Asset Management Plans (AMPs). Sydney Water has recently completed and/or upgraded a complete set of AMPs to support improvements in the robustness of its overall asset management processes across its asset base. As discussed in Section 5.3.3 Sydney Water has an ongoing improvement program to develop the AMPs. These plans detail the approach taken to the planning, creation, operations, maintenance, renewal and disposal of the assets. They also identify the major investment requirements, in terms of operating and capital costs for the short, medium and long term.

Each year, as part of the BPF, the plans are to be reviewed and updated, and the investment implications included into the corporate and divisional plans.

To appreciate the current state of Sydney Water's AMPs, it is important to understand the evolution of the planning process over the past decade, and particularly developments since the last Determination.

Sydney Water's success in implementing this more comprehensive asset management framework has been recently acknowledged by the Water Services Association of Australia (WSAA). WSAA undertook a detailed benchmarking program of Asset Management approaches and processes in the Australian water industry.[21] The 2004 WSAA study, the results of which are summarised in Figure 3, shows that Sydney Water's planning, asset acquisition, asset operation maintenance and renewals processes are now among the best in the Australian water industry. In fact, Sydney Water achieved:

- the highest results in the industry for its processes for acquiring and operating assets;
- near best industry performance for corporate and asset planning; and
- well above the median performance for asset maintenance and renewal programs.

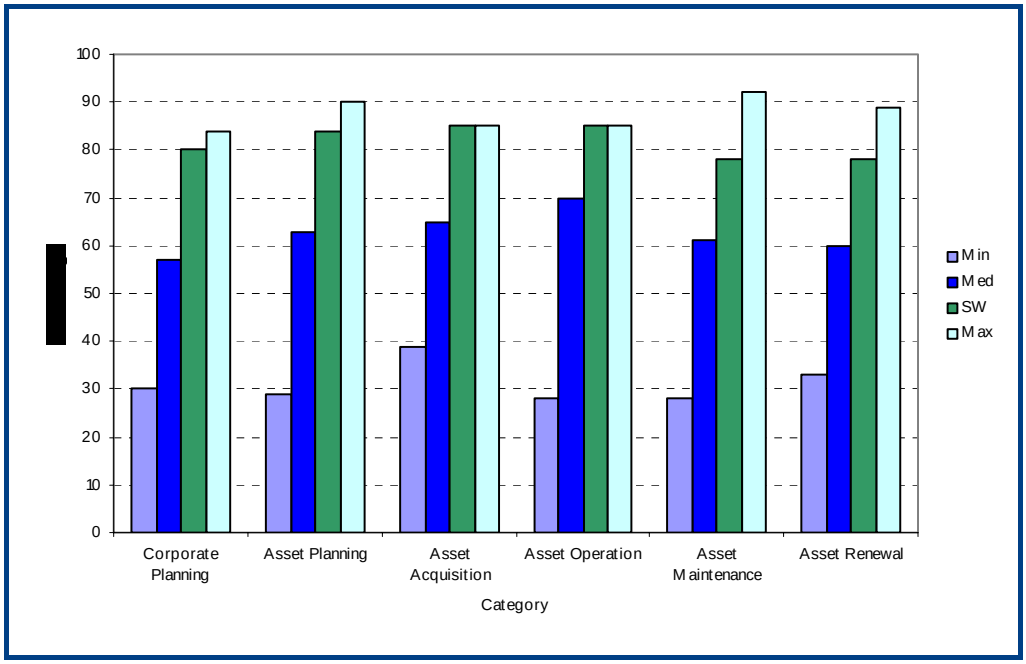

Figure 3: WSAA asset management benchmarking results

[21] Maunsell Power Pty Ltd & Cardno MBK, *Audit Report – Final, WSAA Asset Management Benchmarking Programme,* July 2004

Structured risk management framework

The first stage in the identification of an appropriate set of options to meet service requirements involves the application of a *whole-of-system* approach, which aims to identify areas of higher risk of product and service failure both under current and future conditions. For the longer term this takes account of the expected deterioration in the service of existing assets. Using this approach, it is possible to identify poorly performing assets and then target these for more detailed investigation.

Another aspect of this approach is the application of a *structured risk management* framework which aims to assess and quantify the relative importance of any identified likely service gaps and risks based on the likelihood and consequences of a possible failure or under-performance of an asset. A key part of this assessment involves a consideration of the *criticality* of the asset or group of assets in relation to the consequences of an asset failure. This measure of criticality assists in prioritising Sydney Water's investment and maintenance plans. This approach is currently being applied for major asset classes such as water mains and sewer pipelines, and will be progressively extended to other asset classes where appropriate.

For other asset classes, such as mechanical and electrical plant, the need for maintenance or renewal may be based on one or more of a variety of accepted indicators, including the physical capacity, condition, age, performance and other factors. Whilst the sophistication of techniques used varies by asset class, there is a general program already in place to improve these techniques. In the meantime, at a minimum, Sydney Water applies standardised, systematic option evaluation processes.

Once the assets or groups of assets that require attention have been identified, the next stage of the process involves developing and assessing the range of remedial options for restoring or enhancing the service capability of these elements of the system. In broad terms, the options available to maintain or restore service capacity may involve any one or a combination of the following choices:

- investment in new assets;
- upgrading or augmentation of existing assets;
- maintenance of existing assets; and
- disposal of an asset.

Evaluation of options and application of decision rules

A robust project evaluation process has been in place at Sydney Water for some time. Sydney Water has developed a highly detailed set of *Project Approval Procedures* with a set of guidelines and associated standard forms that support the development of all Business Cases. The *Project Approval Procedures* and *Business Case Guidelines* are consistent with the guidelines recommended by Sydney Water's shareholder.

Projects are evaluated using sound and widely accepted economic evaluation techniques, along with the range of more technically based outcomes. For each project evaluation, a 'do nothing' option is also considered.

The evaluation process is being further enhanced through the implementation of the BPF to:

- ensure a consistent approach to the preparation of business cases for expenditure across the organisation;
- create a clear set of delegations for approval of business cases. From October 2004 all business cases will be independently reviewed by an appropriate officer prior to approval by a General Manager, the FPRC and/or the Board depending on the level of expenditure involved. This process has largely been in place for some years; and
- set out an agreed set of project gateways for updating and reapproval of the business case by appropriately delegated officers.

Projects are accepted on the basis that they produce net economic benefits (or the least cost solution to meeting a regulatory driver). However, Sydney Water recognises that it must live within its means and prioritises which projects it undertakes according to the size of net economic benefits delivered and the risks associated with the projects. This process ensures

that Sydney Water makes best use of its limited resources. The importance of the project evaluation and rationing process highlights the need for a well based and consistently applied evaluation framework.

(3) Prepare Budgets

Once the set of options to best meet Sydney Water's service obligations have been determined through the structured project evaluation process described above, budgets are prepared to support the expenditures in respect of these plans. These budgets are supported by divisional plans, which detail the strategy and specific actions in place to deliver the budgeted outcomes. A key initiative of the BPF is the development of a consistent approach to the preparation of divisional plans, based on guidelines prepared by the FPRC. This initiative is currently in progress and its benefits will be evident in the next series of divisional plans.

Under Sydney Water's BPF, budgets are an integral part of the accountability framework. Where there are (or are expected to be) deviations from budgets, the group responsible for delivering the budget will assess the reasons for this and report back to the FPRC with a recommended course of action. The possible courses of action could include:

- agreement to the additional budget, provided this does not compromise the achievement of a net beneficial project;
- change the scope of the project to deliver greater benefits for the cost;
- delay the project until a cheaper alternative can be found; or
- discontinue the project.

(4) Acquire and apply resources

Sydney Water recognises that the success of a well developed BPF can be undermined by poor execution of a project or business operation. Accordingly, the BPF specifically incorporates a stage aimed at achieving ongoing efficiencies in the procurement of resources, delivery of services, and operations.

Sydney Water has addressed this objective from many angles, and many of the initiatives are covered in the discussion of operating efficiencies throughout this submission. However, broadly, these include:

- benchmarking of the efficiency of processes associated with corporate support services, and in-house maintenance delivery;
- maintenance of a balance between external and in-house works delivery; and
- progressive adoption of more sophisticated contract models, including performance specified maintenance contracts (PSMCs), comprehensive contracts and alliance arrangements.

As a largely project based organisation, contract management and procurement can have a critical impact on business performance. Accordingly, Sydney Water sees what is broadly described as the 'procurement process' as a critical part of the BPF. Sydney Water estimates that around two thirds of all its operating expenditure and 90 per cent of its capital expenditure is procured from external suppliers. Therefore, Sydney Water considers that at least as much time ought to be spent on pursuing efficiency gains in the procurement process as is spent on looking at the efficiency of internal resource use.

In this regard, Sydney Water already has well developed procurement policies and processes. A central feature of this policy is the *Procurement Guidelines Manual*. This manual details Sydney Water's methods of procurement and is complemented by a framework of procurement policies and guidelines. In broad terms, the procurement philosophy reflected in this manual is to acquire goods, services and equipment in an ethical manner that achieves the best value for money through the application of total life cycle cost principles.

Within Sydney Water all forms of procurement for goods, services and equipment require the expenditure of allocated funds from approved budgets. Central to this are the internal delegations and controls that limit expenditure approval authorities. All Sydney Water officers who are authorised to procure goods, services and equipment for the Corporation must be

familiar with the levels of authority needed to control the expenditure of funds on procurement activities.

Notwithstanding the adherence to these Guidelines and associated processes, Sydney Water looks for continuous improvement in its procurement policies and practices. Cap Gemini Ernst & Young undertook a broad review of Sydney Water's procurement in March 2004 with a view to identifying potential savings. The study identified the potential for savings realisation of between $7 million (conservative) and $13 million (stretched) from:

- optimised spending through improved Supply Base Management;
- consolidating spending across Divisions;
- demand management; and
- reducing total costs of purchased goods and services.

A joint working party was subsequently established by Sydney Water to review and realise savings and to develop a more strategic, risk-analysis based management approach. Total annual savings of $6.4 million to-date have been achieved or are anticipated and includes $1.9 million identified in categories outside the original Cap Gemini Ernst & Young scope. These savings having been achieved, or are expected to be generated, from actions implemented during 2003/04. Future actions are expected to yield further savings in 2004/05.

(5) Monitoring outcomes and (6) Report on performance

An important aspect of the Sydney Water's BPF is the accountability managers have for the performance against targets. It is only possible to make managers accountable for their performance if realistic targets are set and agreed, and there is an effective process for monitoring the performance against these targets. Individual performance agreements form the basis of this accountability. The BPF introduces an additional level of governance in the FPRC, which will:

- oversee the delivery of outcomes within budgets;
- investigate major changes to expenditure or scope for particular projects;
- review and approve unbudgeted expenditure (where appropriate); and
- review large projects and major changes before they go to the Board.

Post implementation reviews are undertaken, to assess delivery and performance against the economic and technical performance targets that were established in the business cases. The FPRC will review the learnings from the post implementation reviews periodically, and incorporate any lessons from previous experience into the project evaluation process.

2.4 KEY CHALLENGES FOR SYDNEY WATER

Sydney Water provides a wide range of water and water-related services to a diverse and rapidly expanding customer base. Not only do Sydney Water's customers have high and rising expectations regarding the quality of services they receive, they are also concerned about the potential impact of Sydney Water's operations on the environment, and broader environmental issues such as water scarcity and increasing environmental flows in river systems. The recent sustained drought has further raised public awareness of these issues, and emphasised the need to improve water conservation efforts in the Sydney region.

In response to these challenges Sydney Water has made significant investments to improve the quality of Sydney Water services and Sydney's waterways. Large investments in Sydney Water's infrastructure (including increased treatment levels at inland sewage treatment plants, the Northside Storage Tunnel and the deepwater ocean outfalls) have resulted in significant improvements to Sydney's harbours and beaches as well as inland waterways, particularly the Hawkesbury – Nepean River. Sydney Water has also promoted investment in recycled water projects, and played an instrumental role in the water conservation strategies of the NSW Government.

The key challenges in the years to come include:

- **population growth:** the accelerating population growth in Sydney, which is expected to reach 4.5 million people by 2011. New residents will need to be provided with the same high level of service as existing residents and Sydney Water will need to maintain the environmental improvements achieved over the preceding decades;
- **balancing supply and demand:** implementing a range of actions from the recently announced Strategy;
- **reduce sewage overflows:** the need to further improve the waterways by reducing overflows from the sewerage system;
- **asset management:** the management of aging assets, by minimising the life cycle cost of infrastructure, managing the risk of system failure, and maintaining performance of the system over the long term; and
- **revenue sufficiency:** the achievement of a regulatory outcome which protects the community's investment in Sydney Water and secures future investment by recovering Sydney Water's efficient expenditure requirements and providing an appropriate recovery of the cost of capital.

2.4.1 Population growth

Sydney Water provides its services to nearly 4.2 million people who have diverse and wide-ranging needs and expectations. The largest customer group is residential property owners who consume approximately 70 per cent of the water supplied. Sydney Water also supplies services to commerce and industry, including customers as diverse as heavy manufacturing industry, food and beverage, hospitals and schools and commercial buildings.

In order to effectively respond to this diverse customer base, Sydney Water must apply complex and sophisticated decision support tools in order to identify, assess and prioritise projects to meet the many and varied demands within the limited resources of the organisation.

Sydney Water's customer base is growing rapidly. The NSW Government's 'Compact Cities' policy directs the bulk of this growth (70 per cent) to existing areas in medium and higher density housing, particularly around transport nodes, with the remainder (30 per cent) to greenfield areas. In order to meet the policy's growth targets the NSW Government will release a greater proportion of greenfield areas for development than historically. Plans are presently being developed for major new development areas in the northwest and southwest sectors.

This increased reliance on greenfield development has implications for Sydney Water's costs of delivering the infrastructure required to service this growth. The challenges this presents include:

- the provision of recycled water to reduce the amount of potable water used, so that customers are able to meet the NSW Government's criteria for a 40 per cent reduction in water consumption in new dwellings;
- providing wastewater systems that maintain the quality of the natural environment, particularly in the northwest and southwest sectors, which drain to the Hawkesbury – Nepean River; and
- fostering innovative means of delivering these goals.

2.4.2 Balancing water supply and demand

As highlighted above, a whole-of-government strategy has been prepared in response to the emerging water supply issues in the Sydney region. The Metropolitan Water Plan specifies a range of actions to be implemented by Sydney Water, SCA and other agencies to achieve the NSW Government's objectives of balancing supply and demand for water and improving river health.

Sydney Water is committed to implementing the key recommendations of the Metropolitan Water Plan over the Determination period, including:

- continuation of Sydney Water's demand management program based on least-cost ranking of available options to meet demand management targets specified in the Operating Licence;
- implementation of a *Demand Management and Community Education Fund* to encourage private sector investment in recycled water and water efficiency;
- investments in commercially viable recycled water schemes;
- investigation into desalination; and
- continued strong investment in leak detection, repair, maintenance and pressure management.

Sydney Water will also continue to implement educational communications, enforcement and other programs to manage the current drought.

2.4.3 Reducing sewage overflows

Significant gains have been made in the recent past on reducing the impacts of discharges of effluent to the environment. However, the most significant remaining impact of Sydney Water's activities results from overflows from the sewerage system.

The sewage overflows are being addressed as part of the Overflow Abatement Program over a 20 year time horizon. The initial priority for the program has been to improve the system performance in dry weather, improve wet weather performance in the Blue Mountains, and achieve 'no deterioration' in performance in the remainder of the systems.

The priorities for future improvements in wet weather performance are also being resolved. In particular consideration is being given to the longer-term objectives of the large sewerage systems at Malabar, North Head, Bondi and Cronulla relative to the social cost/benefit gained, the staging of works towards longer-term objectives and the relative contribution of private house sewer lines to wet weather sewer overflows.

2.4.4 Asset management

Sydney Water must simultaneously meet its service requirements and minimise the impact on the environment. This involves striking a balance between investing in programs to meet more immediate customer demands, while at the same time minimising the life cycle cost of infrastructure by maintaining a program of prudent investment in renewals and reliability investments.

As outlined in Section 2.3 Sydney Water has focussed considerable attention on the development and refinement of its BFP. This framework is contributing to Sydney Water's success in meeting service standards with limited resources. However, Sydney Water acknowledges that further improvements can be made upon the business planning initiatives undertaken to date. Although many of the core elements of the business planning initiative are in place, and have assisted Sydney Water make significant savings on capital and operating expenditure, Sydney Water is committed to further development of the framework

2.4.5 Revenue sufficiency

As a regulated water services business, a key aspect of maintaining financial sustainability is to ensure prices reflect efficient costs, including the recovery of the capital cost of the community's investment in Sydney Water. An immediate focus for Sydney Water will be to secure an outcome from this Price Review that reflects the fair value of investments already made, and to be made, on behalf of the community. Sydney Water's expenditure requirements are driven by its whole of life approach to managing its assets, and Sydney Water has robust systems in place to ensure this expenditure is efficient.

To meet this challenge Sydney Water seeks to provide the Tribunal with accurate and comprehensive information on the costs associated with provision of water services. The information provided also responds to the issues raised by the Tribunal in the previous Determination, and in particular, in those areas where performance has been perceived to be inadequate.

3 Regulatory context

This section considers the regulatory environment for the review. Section 3.1 outlines the aim of regulation before discussing performance based regulation in more detail. The regulatory period is discussed in Section 3.2.

3.1 INCENTIVE REGULATION

3.1.1 The aim of regulation

Sydney Water is regulated by the Tribunal under a price cap approach. The Tribunal determines prices with the objective of generating sufficient revenue to allow the recovery of efficient operating and capital costs necessary to provide the appropriate level of services during the Determination period.

Incentive regulation is an innovation in regulatory policy that was developed in the 1980s and has been applied to regulated entities like Sydney Water around the world. The role of the regulator is to promote efficiency and to reduce the scope for monopoly pricing. In effect, the role of the regulator is to act as a proxy or substitute for market forces, where the operation of the market is inadequate to effectively constrain the market power of the regulated entity. However, the regulatory arrangements also seek to encourage further efficiencies and cost savings by the regulated business.

Price cap regulation tackles these issues by fixing the firm's price (or price path) for a period of time. Once the Tribunal has set Sydney Water's price path Sydney Water bears the risks associated with factors such as varying input prices and shifting water demand.[22]

The success of this form of regulation is determined by the strength of the incentives created for the regulated entity to reduce costs. The performance incentives arise because the regulated firm is able to retain the additional profits earned from efficient performance, at least for the length of the Determination period. The strength of the incentives are related to the:

- scope to reduce costs; and
- how long the regulated business is allowed to keep any efficiency gains.

In general the regulator will typically conduct a new review every four to five years. The price review provides the opportunity for the regulator to recover, in lower prices for consumers, some or all of the efficiency gains that the firm has made in the previous regulatory period. The price review also allows the regulator to take into account significant movements in costs that might arise from key cost drivers such as demand growth or costs of capital.

Sydney Water endorses the CPI $\pm$ X incentive regulatory regime. However, the Tribunal is required to take into account other objectives in addition to economic efficiency, including customer protection, environmental projection and financial viability.[23] As a practical matter, in establishing the appropriate price cap the Tribunal is required to strike a balance between these diverse objectives. However, it is important not to lose sight of the efficiency objectives with which economic regulation is primarily concerned. With that in mind, it is important that any trade-offs between objectives are both clear and transparent, and that decisions reflect the comparative advantage of using particular policy instruments to achieve competing objectives.

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[22] In some circumstances the regulatory arrangements may allow for risks associated with non-controllable costs (for example significant regulatory shifts) to be shared, by allowing a price determination to accommodate cost increases if certain trigger events occur. Such an approach is discussed in more detail later in this section.

[23] See Section 15 of the *Independent Pricing and Regulatory Tribunal Act.*

3.1.2 Revenue versus price cap regulation

A price cap establishes a ceiling on allowable prices. Revenue cap regulation works much the same way as price cap regulation, however, instead of indirectly limiting a company's revenues by controlling its prices, a revenue cap formula directly limits the total amount of revenue a company can receive.

From Sydney Water's perspective the key difference between the two methodologies is that it may be exposed to significant revenue risk under a price cap regime given the significant variability in demand. For example, the extension of water restrictions can lead to significant reductions of water demand, and hence to Sydney Water's revenues. This revenue variability will be exacerbated by any move to increase usage prices. Sydney Water believes that is it appropriate to provide a mechanism within the regulatory arrangements to accommodate these risks.

There are a number of options available to regulators to mitigate this risk. One option is to move to a revenue cap model. This would allow Sydney Water to vary prices in response to substantial variations in quantity of water sold – due, for example, to water restrictions. However, given the complexity of frequently varying water charges, Sydney Water does not consider that this option would in practice provide Sydney Water with the flexibility to respond to changes in market circumstances.

An alternative solution is to provide the regulator with the opportunity to review the price cap if a material external event leads to a significant and unsustainable change in forecast revenues.

3.2 REGULATORY PERIOD

Sydney Water's preference is for a four year regulatory period. This preference reflects a prudent balance between the advantages of establishing an effective incentive based regulatory regime with the requirement to ensure that prices remain generally cost reflective.

However, there are a number of risks borne by the business that are associated with locking in the regulator's decisions for a number of years. In advocating a four year regulatory period Sydney Water also supports the establishment of a clear and transparent process for responding to exogenous events within the regulatory period. The following section provides an overview of the considerations relevant to determination of the preferred regulatory period and Sydney Water's proposal to manage regulatory uncertainty.

As outlined above a distinctive feature of CPI6X price control is the establishment of a price cap that remains in force during the regulatory period. The opportunity for the regulated entity to earn higher returns from superior performance establishes the foundation for the efficiency incentives that are inherent in price cap regulation.

However the strength of the incentives that are inherent in price cap regulation will depend on the length of the regulatory period, as well as the scope for efficiency improvements. If prices are reviewed frequently, that is the regulatory period is short, then as with cost-plus regulation, the incentives for cost reduction are weak, since prices track actual costs closely. If, on the other hand, the regulatory period is longer, incentives for cost reduction strengthen, because the firm can retain any profit it can generate over the regulatory period.

However, there are two downsides associated with a longer regulatory period. The first problem is that business costs may depend on a number of factors that are outside the control of the firm. Second, allocative efficiency may suffer if prices get out of line with underlying costs.[24] The optimal length of the regulatory period then has to be a trade-off between:

- the desire to encourage the regulated business to pursue cost savings; and
- the desire to promote allocative efficiency.

[24] Allocative efficiency is concerned with ensuring that prices charged to customers reflect the costs of production. This ensures that scarce resources are allocated to the uses that consumers most highly value.

Another problem associated with longer regulatory periods is that it limits the scope to respond to exogenous events which may impose significant new costs, or unanticipated falls in revenues. The following section outlines a proposal for responding to these problems in an efficient and transparent manner. With a clear process for responding to exogenous events if and when they arise, the regulator can adopt a longer regulatory period, and therefore harness the dynamic efficiency benefits of incentive based regulation.

3.3 MANAGING UNCERTAINTY

3.3.1 Introduction

As noted in the previous section a key element of incentive based regulation is that a price cap is established for a predetermined period. That is, once prices are set, the regulator does not subsequently adjust prices within the Determination period to reflect differences between actual and forecast costs of service provision.

However, a problem arises if events that are substantially or totally outside the control of the regulated entity lead to significant and unexpected costs being imposed on the regulated entity.

Sydney Water proposes mechanisms to manage this cost and revenue uncertainty below.

3.3.2 Cost pass-through mechanism

Unless there is an ability to respond to these events as they transpire then it is possible that Sydney Water would have insufficient revenue to meet its service obligations.

Sydney Water proposes that a mechanism be introduced to manage these risks within the Determination period in a systematic and low-cost way. There are a number of principles that are relevant in determining the scope of price adjustments and the process for their application. These include:

- **focus on non-controllable risks**: events that trigger a review should be outside the control of the regulated business;
- **materiality**: the event should lead to a material impact on the regulated business;
- **minimise review costs**: the regulatory arrangements should minimise the costs associated with approving adjustments. This suggests that some predetermined rules and processes should be established to determine how these adjustments will be considered; and
- **preserve predictability**: regulators should also be encouraged to provide as much certainty as possible within the regulatory period. The requirement for predictability is an argument for confining the scope of the review to determining the price implications of the cost or revenue changes triggered by the event.

Trigger events should be outside the control of the regulated business and identified in advance. The suggested list of specific trigger events includes:

- costs associated with any response to the ongoing drought;
- amendments to environmental standards or legislative or regulatory obligations (for example, an increase in an environmental standard that cannot be met by existing resources of Sydney Water, or an obligation to manage new services);
- changes in regulatory obligations (for example, changes to laws that influence the costs of laying/repairing underground assets);
- unanticipated changes in licence obligations;
- cost associated with catastrophic events such as acts of terrorism, natural disasters, earthquakes; and
- costs associated with material changes in wholesale water prices.

It is proposed that the regulator would agree to a pass-through if the trigger event leads to a material change in costs. It is also recommended that the Tribunal would engage in a focussed consultative process in assessing the case for pass-through.

Similar arrangements are in place in a number of other jurisdictions and industries, for example, electricity distribution in NSW and water and wastewater services in the ACT.

3.3.3 Revenue volatility mechanism

The Issues Paper identifies the potential revenue volatility associated with consumption forecasting and medium-term price setting in the current environment of continued drought and water restrictions. Future demand management initiatives and changes in tariff structure will further increase revenue volatility over the next regulatory period. Given that underlying costs are largely fixed, this translates to increased earnings risk for Sydney Water.

Sydney Water proposes a mechanism be introduced to address forecast risk and resultant revenue volatility. The Issues Paper states that the need for such a mechanism is dependent on who is best placed to manage the risk. As the volume of water sales is largely outside the control of both the business and individual customers, neither is best placed to bear the risk. As such, Sydney Water proposes that the risk should be shared.

Sydney Water proposes an annual revenue adjustment mechanism, for a component of any excess/shortfall revenue arising due to differences between forecast and actual consumption. Sydney Water proposes that annual consumption variations be subject to a tolerance band (of under 10 per cent) before any adjustment mechanism is triggered. In the event the tolerance band is not triggered on an annual basis Sydney Water proposes to carry over any over or under-recovery for distribution at the end of the regulatory period.

Further, to ensure that Sydney Water is not penalised twice in terms of revenue smoothing, any additional revenue arising from higher than forecast consumption should be measured against the cost reflective revenue requirement, rather than the agreed transitional path.[25] This means that any additional revenue arising from excess consumption will be first offset against any net present value (NPV) shortfall associated with revenue smoothing, before being passed on to customers.

Sydney Water proposes that changes to tariffs would be made with reference to fixed rather than variable charges, to maintain appropriate water conservation incentives.

This approach shares the risk of forecasting errors between businesses and customers, and reduces the inherent incentive under a price cap to understate forecast volumes. It also reduces incentives for businesses to maximise profit by selling more water (to the limited extent that businesses can impact on sales volumes).

Sydney Water proposes to work with the Tribunal and other stakeholders to further develop the form of revenue adjustment mechanism and the extent to which the risk should be shared between water businesses and customers.

[25] This assumes that the Tribunal will adopt an end point smoothing methodology. Sydney Water's recommendations in relation to end point smoothing are discussed in more detail in Section **6.5**.

4 Sydney Water's economic performance

When setting Sydney Water prices, one of the Tribunal's most important considerations is the economic efficiency with which Sydney Water provides water, wastewater and stormwater services.

This section describes the outcomes of a number of studies undertaken to assess Sydney Water's economic performance, both over time and in comparison to other water utilities. Important information is also provided on the appropriate interpretation and use of these studies in the context of the current Price Review.

The studies show that Sydney Water is technically efficient compared to comparable water utilities in the United Kingdom and Australia, and has achieved productivity growth that generally exceeds that of other Australian water utilities, the combined electricity, water and gas utility sector, and the Australian economy.

4.1 PERFORMANCE MEASUREMENT AS A MANAGEMENT TOOL

As described earlier in Section 2.3, Sydney Water uses robust economic performance measurement tools as part of its Business Planning Framework (BPF). The measures of economic performance are used to provide insight into:

- the efficiency with which Sydney Water uses its resources and how this has changed over time;
- the optimal trade-off between capital and labour in the provision of its services;
- drivers that have positive and negative impacts on efficiency and productivity; and
- the future efficiency consequences of business plans, as part of a suite of other business tools.

The utilisation of robust performance measurement and other efficient processes for resource management and service delivery provides a basis for achieving efficient cost outcomes and continuous performance improvement.

4.2 REVIEW OF PERFORMANCE MEASUREMENT STUDIES

Studies that measure economic performance can be broadly classified into two groups:

- **comprehensive performance studies:** these studies use comprehensive performance measurement techniques that seek to capture as many of the firm's inputs, outputs and operating environment characteristics as possible within a *single performance measure*. This approach allows an assessment of the overall performance of a firm over time; and
- **partial performance studies:** these studies examine a single aspect of a firm's performance in isolation, such as:
    - a single process or service (for example maintenance or customer service). This is known as bottom up benchmarking and provides the best overall picture about Sydney Water's performance over time; or
    - a single input used (such as labour) in relation to a single output produced (such as volume of water delivered). This produces partial efficiency measures useful in identifying specific areas where improvements can be made.

The results of comprehensive and partial studies of Sydney Water's performance are briefly outlined below. More detailed information is provided in Appendix A.

4.2.1 Comprehensive measures of performance

Sydney Water has commissioned two comprehensive studies of its economic performance:

- Centre for Efficiency and Productivity Analysis (CEPA) 2003: This study by Professor Tim Coelli of the University of Queensland's CEPA uses Data Envelopment Analysis (DEA) to

measure efficiency relative to other water utilities in Australia and the United Kingdom and measures productivity growth over time using Total Factor Productivity (TFP) measures and Malmquist DEA; and

- Frontier Economics 2004: This study uses TFP to examine Sydney Water's economic performance over a longer time period than the CEPA study. The Frontier Economics study also incorporates more detailed treatment of Sydney Water's main input, that is, capital.

In terms of modelling approach and production functions, both of these studies are similar to those previously commissioned by the Tribunal in the context of its electricity price reviews (in 1994 and 1999).

The results of the CEPA and Frontier Economics studies are presented and discussed below and in Appendix A. These studies will be made available to the Tribunal and its consultants as part of the review process.

CEPA analysis 2003

This study was commissioned by Sydney Water and used a range of comprehensive benchmarking techniques to assess performance including:

- DEA to measure the relative efficiency of the firms in the study at a single point in time; and
- Malmquist DEA and Törnqvist TFP to measure productivity change over time among the sample firms.

This study is the most up-to-date and comprehensive performance review of Australian water and wastewater services and has provided Sydney Water with valuable insights into the level and sources of its relative economic efficiency. The study involved a sample of 49 firms including:

- 18 WSAA members;
- 11 additional Queensland firms;
- 10 additional Victorian firms; and
- 10 firms from the United Kingdom.

The results were calculated for the following activities:

- water supply;
- wastewater; and
- water supply and wastewater combined.

DEA produces efficiency scores between zero and one. A score of 1.0 or 100 per cent means that the firm is technically efficient compared with the other firms measured and is on the efficient production frontier.[26] A score of 0.7 or 70 per cent indicates that the firm could produce the same outputs with 30 per cent less inputs (disregarding any operational constraints faced in achieving this). The DEA scores produced in the study are shown in Appendix A.

The CEPA DEA analysis shows that under the comprehensive performance measurements used Sydney Water performs very well relative to other firms considered. The study indicated that Sydney Water is technically efficient, meaning it is using the optimal combination of inputs to produce its outputs (relative to comparison firms), but faces some disadvantages in relation to scale:

- Sydney Water is fully technically efficient (that is it has a DEA score of 100 per cent) in models all except the wastewater business where Sydney Water's DEA score is 86.4 per

[26] The production frontier shows that maximum output that can be produced using a given amount of input and hence represents the best practice performance amongst the sample of firms.

cent (suggesting that Sydney Water should be capable of treating the same volume of wastewater with 13.6 per cent fewer inputs that it currently uses);

- Professor Coelli prepared an alternative wastewater model to adjust for the differences between United Kingdom and WSAA firms. The wastewater model excluding the United Kingdom firms resulted in Sydney Water achieving a DEA score of 100 per cent;[27] and
- all of the DEA models are based on an assumption of constant returns to scale show that Sydney Water is operating above the optimal scale. However, this source of inefficiency is outside the control of Sydney Water management.

As well as producing measures of relative efficiency levels of water utilities, the CEPA study measured and analysed productivity growth among the sample of WSAA firms from 1995/96 to 2000/01. The results show that over this period Sydney Water achieved productivity growth that exceeded the mean growth among the sample firms in most cases.[28]

Frontier Economics TFP analysis

Frontier Economics has assessed Sydney Water's productivity over time using Törnqvist TFP. The study measures productivity performance for the firm as a whole over the 11 year period from 1992/93 to 2003/04. The study, which accounted for both the level and quality of services provided by Sydney Water, showed that Sydney Water has had sustained modest productivity growth since 1998/99 and achieved a more significant productivity improvement since 2003/04.

Sydney Water's TFP results were compared against TFP measures for the electricity, gas and water utility sectors, and the Australian economy. The results in Figure 4 show that Sydney Water achieved higher and more consistent productivity growth than the utility sectors and the economy as a whole.[29] These results are consistent with the CEPA study in that Sydney Water was found to have generally experienced productivity growth over the late 1990s and into the new century.

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27 The wastewater inputs are specified as operating expenditure and km of mains (as a proxy for the quantity of capital inputs). Professor Coelli's report suggests that the wastewater model, which specifies a physical measure of capital, unfairly penalises the WSAA firms (including Sydney Water) in comparison to the United Kingdom firms included in the analysis. This is because the United Kingdom firms have newer assets and hence are likely to have lower maintenance requirements.

28 Two modelling approaches were used to measure productivity growth: Malmquist DEA and Törnqvist TFP. Sydney Water had higher productivity growth than the WSAA mean in the Törnqvist TFP measures for water, wastewater and water/wastewater combined. Using Malmquist DEA Sydney Water has higher productivity growth in its water and water/wastewater combined activities. Productivity growth was slightly lower for wastewater.

29 The electricity, gas and water utility Multi Factor Productivity (MFP) index is produced by the Productivity Commission (http://www.pc.gov.au/work/productivity/performance/industry.html) and the MFP index for the Australian economy by the Australian Bureau of Statistics (National Accounts, Table 22, Productivity in the Market Sector, Multifactor productivity).

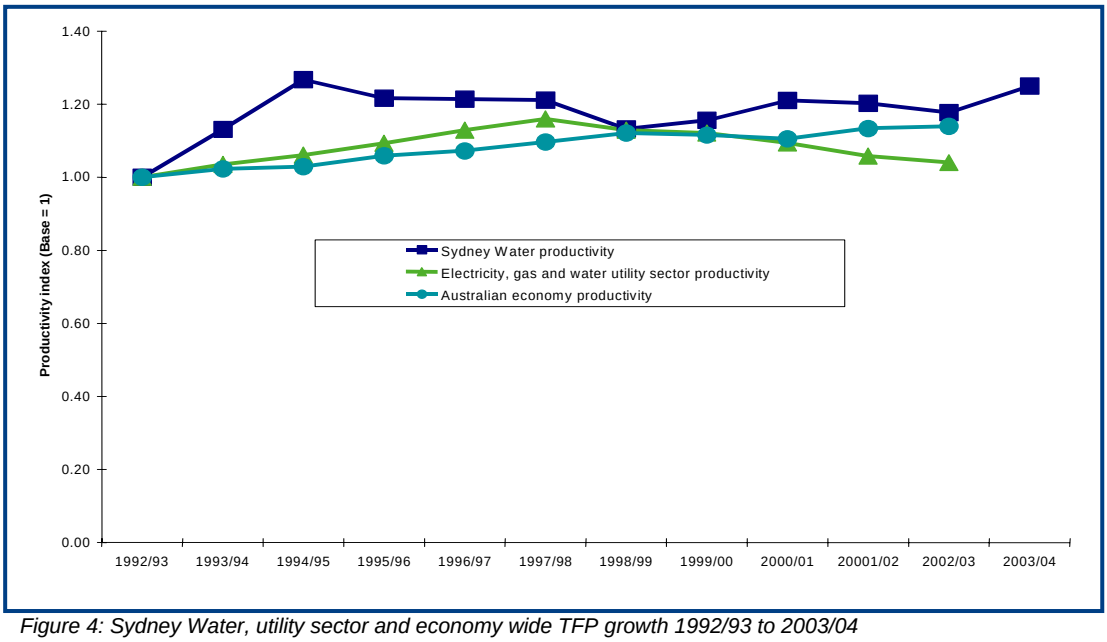

Figure 4: Sydney Water, utility sector and economy wide TFP growth 1992/93 to 2003/04

4.2.2 Partial measures of performance

In addition to the comprehensive measures mentioned above, Sydney Water has undertaken a number of partial studies to identify potential areas for specific performance improvement in the future. Not unexpectedly, these studies come to a range of conclusions about Sydney Water's performance. Along some dimensions Sydney Water performs well and in other cases Sydney Water's performance does not compare well with other broadly similar firms.

Sydney Water has responded to the key recommendations of the studies, with the intent of delivering efficiency savings over the price path period. For example, the WSAA/WS Atkins Shared Services Benchmarking identified gaps between best practice and Sydney Water's performance in human resources and finance. Sydney Water has addressed these gaps in its forward planning and ongoing reforms. Sydney Water's initiatives to reduce corporate costs are discussed in more detail in Section 5.3.1. These and further cost savings are reflected in the forecasts presented in Section 6.

4.3 PERFORMANCE MEASUREMENT AND REGULATION

The studies outlined above, particularly the studies that produce comprehensive measures of economic performance, provide useful insights into Sydney Water efficiency and productivity growth. A key question is to what extent these results are applicable in the Tribunal coming to a view about the scope for achievable efficiency gains over the Determination period. In this regard, it is important to be aware that:

- the models are best treated as broad indicators of performance rather than precise measures; and
- they provide information on historical, not forecast, performance.

4.3.1 Broad indicators of performance

Any modelling analysis, including efficiency and productivity modelling, has its limitations in providing precise information about the scope for achievable efficiency gains. In the case of the studies outlined above these limitations include:

- **model specific limitations:** all models inevitably have their limitations in terms of how well they have been able to explain true performance. Limitations are driven by:

- **data limitations:** limitations in data availability, data accuracy, and comparability between firms; and
- **model specification:** limitations in capturing inputs and outputs as well as key operating environment factors impacting performance but outside management control.

It should be noted that ensuring comparable data is used and accounting for environmental differences is crucial if comparisons are being made to firms in other countries;

- **constraints on achieving identified efficiency gains:** the measures of relative efficiency and productivity gains reflect all aspects of efficiency including technical efficiency and scale efficiency. However, factors in the firm's operating environment may limit the ability to achieve identified efficiency gains.

Therefore, using these broad indicators of performance as efficiency targets (which also relate to all inputs not just operating inputs) may result in targets being set for operating expenditures that are not achievable.

While these cautions apply, Sydney Water has been assessed as being relatively efficient and has generally outperformed the WSAA average, the electricity, gas and water sector utilities, and economy wide measures of productivity growth.

4.3.2 Historical information only

The second key issue is that the studies only provide historical information on rates of productivity gain. This does not necessarily provide an accurate indication of the likely productivity growth rates over the price path period. Therefore, in coming to a view about the scope for productivity gains, the Tribunal will need to consider:

- information on expected Sydney Water costs over the Determination period;
- the potential impact on Sydney Water's productivity growth of requirements for substantial investment;
- the influence of the operating environment on Sydney Water's performance; and
- expected industry wide or economy wide productivity trends.

This will ensure that the regulatory settings are related to achievable efficiency and productivity gains and that appropriate incentives are maintained.

5 Business performance over the current period

While Section 4 considered Sydney Water's overall *economic* performance, this section considers specific aspects of Sydney Water's business performance over the current Determination period. This section begins by considering the service outcomes delivered by Sydney Water in 2003/04 and the outcomes expected in 2004/05, before discussing Sydney Water's performance against the financial targets set for the current Determination. It then considers Sydney Water's significant progress in a number of additional areas raised by the Tribunal in the previous Determination.

5.1 SERVICE OUTCOMES

The 2002/03 independent audit of Sydney Water's Operating Licence showed that Sydney Water performed strongly against the Operating Licence requirements, achieving full or high compliance for 89 per cent of requirements, up from 83 per cent the previous year (see Table 2). In particular, Sydney Water demonstrated full compliance with drinking water quality requirements. Of particular note is that for the first time since corporatisation the lowest assessment was 'partial compliance', with no 'low' or 'non-compliance' ratings recorded. It is expected that Sydney Water will achieve compliance with all its Operating Licence service standards for 2003/04.

Table 2: Summary of performance against Operating Licence 1995-2003

Compliance scale	1995	1996	1997	1998	1999	2001	2002	2003
Full	33%	37%	56%	51%	56%	66%	69%	67%
High	20%	35%	33%	28%	23%	14%	14%	22%
Partial	13%	17%	5%	12%	17%	10%	11%	5%
Low	2%	1%	1%	4%	1%	5%	3%	0%
Non	0%	3%	0%	0%	0%	4%	1%	0%
Insufficient information	31%	7%	4%	4%	3%	1%	2%	7%

Total complaints made to Sydney Water have declined by 16 per cent from 2002/03 and 2 per cent compared with 2001/02. Notable changes include:

- customer service complaints decreased by 23 per cent;
- billing complaints reduced by 14 per cent;
- water quality complaints have been steadily declining, being 44 per cent lower than 2001/02 and 33 per cent lower than 2002/03;
- complaints regarding noise, odour and overflows decreased by 20 per cent, 16 per cent and 13 per cent respectively; however
- complaints made about staff and contractors have risen over the period, as have drought-related complaints.

Sydney Water has directed much effort and investment to ensuring the quality delivery of these services – in spite of financial challenges posed by the drought and relatively stringent regulatory standards.

Key performance outcomes for 2003/04 are listed below.

Water quality

- Sydney Water's drinking water quality achieved full compliance with the 1996 Australian Drinking Water Guidelines health-related and aesthetic-related values.
- Sydney Water achieved 88 per cent customer satisfaction with tap water in 2003/04.

Water conservation

- Water restrictions have helped save around 63 billion litres of water since being introduced in October 2003.
- The Residential Retrofit Program has been targeted at suburbs with large households, high water consumption, and high water supply and wastewater treatment costs. By the end of July 2004, approximately 236,800 homes had been retrofitted (approximately one in seven households), including 28,892 households in 2003/04. Consumption monitoring of houses participating in the indoor program has indicated sustained average household water savings of 20,900 litres per year, four years after they have been serviced. The overall savings being achieved by the program at the end of June 2004 was 4,900 megalitres (ML) per year.
- More than 3,385 rainwater tank rebates were paid to June 2004, equating to combined water savings of 160 million litres per year.
- The washing machine rebate program saw 6,545 rebates paid to customers in 2003. Each washing machine purchased helped save around 15-20,000 litres of water per year.
- More than 200 companies have joined Sydney Water's *Every Drop Counts Business Program*. Savings of 6.1 billion litres per year have been identified.

Recycled water

- Sydney Water is recycling more than 39 million litres of wastewater per day, that is, 14 billion litres per annum.
- The Rouse Hill Recycled Water scheme is the largest residential recycled water scheme in Australia. The Rouse Hill Recycled Water Plant recycled 1,337 ML to households for toilet flushing and garden watering in 2003/04. On average the scheme is reducing demand for drinking water by 35 per cent per household.
- More than 23 million litres of recycled water are used in Sydney Water's sewage treatment plants each year. Over 80 per cent of all water used in the plants is recycled water, an increase from 50 per cent in five years.
- Through its Irrigation Recycled Water Schemes, Sydney Water manages 10 schemes for irrigating golf courses, parks and agricultural land. For example effluent from St Marys, Quakers Hill, Penrith and Richmond Sewage Treatment Plants is reused to irrigate playing fields or golf courses.
- All dry weather flow from Picton Sewage Treatment Plant is used for growing fodder crops with no effluent discharged to the river.

Water networks

- 54 km of water mains were renewed in 2003/04.
- The *Active Leaks Reduction Program* remains on track with losses from Sydney Water's networks reduced by 41.5 ML per day since 1999. This reduction is in line with the targeted 60 ML per day reduction by June 2006. In 2003/04 7,102 km of water mains were inspected and inspection of a further 7,000 km is planned in 2004/05.

Sewage treatment plants

- Effluent quality limits set by the environment protection licences for all sewage treatment plants are being met. Operational issues with Cronulla Sewage Treatment Plant's Ultra Violet Disinfection Unit were addressed to ensure compliance with the faecal coliform limit.

- Upgrades to Hornsby Heights and West Hornsby Sewage Treatment Plants have significantly reduced nitrogen loads into Berowra Creek and its estuary. Loads have been reduced by 322 kg/day relative to 2001/02 levels.

Sewerage networks

- Sewerage network performance has improved since 2002/03, however, a number of Sewer Catchment Asset Management Plan (SCAMP) areas are unlikely to meet their Pollution Reduction Program targets for the year, due to the accelerated tree root regrowth in a number of areas where sewer cleaning works have been completed.
- 518 km of sewer lines were cleaned and 80 km were relined.
- Compared to the previous year, there was a significant 14 per cent decrease in the number of field-verified overflows from our sewerage systems during 2003/04.
- Over the past year, 83 sewage pumping stations were upgraded under the *SewerFix Pumping Stations Program*, bringing the total completed under the program to 259. Of this total, 32 sewage pumping stations have actually been eliminated (including seven in the past year) and replaced with underground tunnels that allow sewage to flow using gravity rather than pressure. The elimination of these pumping stations not only helps to prevent sewage overflows but also helps save money through reduced operating costs and reduced energy use.
- The Northside Tunnel was operational 17 times in 2003/04, preventing over 17 billion litres of diluted sewage entering Sydney Harbour of sewage. There have been no overflows to the environment from any of these events.

Protecting the environment

- Through its work on coastal sewage treatment plants, including the Illawarra Wastewater Strategy, Sydney Water is protecting beaches:
    - all beaches passed water quality criteria and are safe for swimming and other water based recreation;
    - the majority of Sydney and Illawarra beaches were suitable for swimming 100 per cent of the time; 34 out of 35 Sydney beaches were suitable for swimming over 80 per cent of the time in summer, and all 14 Illawarra beaches were suitable for swimming over 80 per cent of the time in summer; and
    - improvements to the Wollongong Sewage Treatment Plant are being progressively commissioned from mid-2004, following on upgrading of the Cronulla Sewage Treatment Plant to tertiary treatment in April 2001, raw sewage pump upgrade at North Head in 2001 and upgrading of Warriewood disinfection facilities in June 2000.
- Sydney Water is protecting rivers through the Hawkesbury – Nepean Wastewater Strategy, the South Western Sydney Sewerage Scheme and the Priority Sewerage Program. In 2003/04 phosphorus discharges from sewage treatment plants to the Hawkesbury – Nepean River reduced by 19 per cent and nitrogen by 6 per cent despite the increase in wastewater flows from population growth.
- Through the Biosolids Strategy, Sydney Water continues recycling of over 99 per cent of captured biosolids.

Energy

- Total Sydney Water energy use fell by six per cent.
- Renewable electricity is generated at the Malabar and Cronulla Cogeneration Plants from digester gas. In the year to date cogeneration has represented approximately 4 per cent of Sydney Water's total energy consumption. A further 2.5 per cent renewable energy is purchased as Green Power.

Stormwater

- Approximately 1,930 cubic metres of rubbish and 1,567 tonnes of sediment were collected from pollution control devices in 2003/04.

Business performance over the current period

Customer satisfaction

The 2004 Annual Residential Customer Survey indicated that while trust in Sydney Water has been impacted by the water shortages (and associated media commentary), satisfaction with the core products and services have remained stable. Other key findings from the report included:

- Perceptions of 'value for money' remain high with 82 per cent considering Sydney Water's services good value, a level unchanged from previous years.
- Sydney Water's rating as a service provider is equivalent to Australia Post and Electricity companies (and well above main Telecommunications companies and Local Council).
- Overall satisfaction with tap water was unchanged since last year (88 per cent). The trend for the 'very satisfied' component continues to increase (after the decrease experienced after the 1998 water quality incident).
- Incidence of problems with tap water has been in slow decline since 2000 (then 20 per cent, now 10 per cent).
- Overall satisfaction with sewerage services is quite high and on par with 2003 rating (83 per cent).
- Perceptions of beaches and waterways have continued to improve for Illawarra beaches, ocean beaches and Sydney Harbour. However, perceptions of the quality of the Hawkesbury – Nepean and Georges Rivers have fallen.
- Overall satisfaction with customer contact made with Sydney Water has continued to increase (70 per cent in 1998, 83 per cent in 2004).

There are quite high levels of awareness of recent Sydney Water initiatives (two thirds or more for rainwater tank rebate and Retrofit Program, and almost 90 per cent for Go Slow on the H_2O campaign).

5.2 FINANCIAL PERFORMANCE AGAINST THE PREVIOUS DETERMINATION

This section considers Sydney Water's performance against the financial targets set by the Tribunal for 2003/04 and 2004/05 in the previous Determination. It considers Sydney Water's actual performance for 2003/04, and forecast performance for 2005/06 (as the second quarter of the fiscal year has only just commenced).

There is considerable uncertainty over the duration of water restrictions, and hence demand, for 2004/05.[30] For the purpose of forecasting costs and revenues Sydney Water has assumed that water restrictions are lifted in January 2005.

5.2.1 Operating expenditure

For the period of the previous Determination the Tribunal required Sydney Water to reduce operating expenditure by $13 million (0.8 per cent) below its forecast. The Tribunal based these targets on:

- Sydney Water's request plus $3 million per annum for additional security costs; and
- a review of Sydney Water's proposed operating expenditure, specifically corporate expenditure. This review identified customer services and information technology services, including agency labour costs, as specific areas where savings could be made.[31]

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30 Voluntary water restrictions commenced in 15 November 2002, Level 1 water restrictions were imposed from 1 October 2003 and Level 2 restrictions commenced in June 2004. The Government will introduce further restrictions is the dam levels drop below 40 per cent.

31 Halcrow Pacific (December 2002), *NSW Agencies Review, Overview Report,* p29.

Operating costs over the two years of the previous Determination are within 2 per cent of target. Sydney Water has outperformed the target for 2003/04, but forecasts that it will not achieve the target for 2004/05. Table 3 shows Sydney Water's actual operating costs in 2003/04 and budgeted operating costs for 2004/05.

These operating costs exclude:

- financing charges;
- depreciation expenses;
- the costs associated with non-regulated activities;
- superannuation: Sydney Water's superannuation expenses are driven primarily by fund earnings and gross liability movements and therefore fluctuate considerably in response to external factors. The Tribunal's targets have also been adjusted to remove the allowed normalised profile for superannuation; and
- prior year adjustments and write off of Work in Progress (WIP): The previous Determination did not include any costs for prior year adjustments and write off of WIP, since these adjustments and write offs relate to the costs of other years.

Table 3: Sydney Water operating cost performance against Tribunal target 2003/04 and 2004/05

Expenditure ($million 2004/05 dollars)	**2003/04 actual**	**2004/05 budget**	**2 year total**
Tribunal target[1]	$771	$765	$1,536
Sydney Water operating costs	$759	$809	$1,568
Performance compared to target **percentage variation**	**-$12** **-2%**	**$44** **+6%**	**$32** **+2%**

Note:

1. Independent Pricing and Regulatory Tribunal, Prices of Water Supply, Wastewater and Stormwater Services from 1 July 2003 to 30 June 2005, p10, Table 4.2. The Tribunal's target has been escalated to 2004/05 dollars based on actual inflation and adjusted for the removal of superannuation and prior year adjustments and WIP write offs.

There are clear and reasonable explanations for Sydney Water surpassing the target for 2003/04 and the expectation that it will not be able to achieve the 2004/05 target. Table 4 identifies the sources of the differences between the Tribunal's target and Sydney Water's actual 2003/04 and budgeted 2004/05 operating expenditure.

Table 4: Differences between Tribunal target and Sydney Water operating costs 2003/04 and 2004/05

Expenditure ($million 2004/05 dollars)	2003/04 actual	2004/05 budget	2 year total
Bulk water costs (purchase and treatment)	-$10	-$8	-$18
Other provisions	-$23	-$11	-$34
Redundancy costs	+$15	+$15	+$30
Reductions in capitalised non-labour costs	+$15	+$20	+$35
Reductions in capitalised labour costs	+$15	+$23	+$38
Net change in other inputs	-$24	+$5	-$19
Total	**-$12**	**+$44**	**+$32**

The main differences between the Tribunal's targets and Sydney Water's operating cost outcomes are:

- **bulk water costs**: both purchase and treatment costs have varied from those included in the previous Determination. This is primarily due to a reduction in volumes purchased and treated due to water restrictions, but is also a function of changes in price escalation and minor changes in water quality. The two year variation of $18 million is less than 4 per cent of the amount set in the Determination;
- **other provisions**: these include workers' compensation and general insurance provisions. Based on recent actuarial assessment, workers' compensation provisions decreased in 2003/04, however are estimated to slightly increase in 2004/05. General insurance provisions have decreased due in part to more active management of the program and a change in broker. Due to volatility these are forecast to again increase slightly in 2004/05;
- **redundancy costs**: the previous Determination did not make any allowance for the cost of redundancies, however, these costs are a key input to future efficiencies. Redundancy costs accounted for $30 million of additional costs over the period. Sydney Water's operating expenditure requirements over the next regulatory period includes allowance for redundancy costs;
- **capitalised labour and non-labour costs**: reductions exist as a result of a change in capitalisation policy to better reflect accounting standards. This increased labour and non-labour costs by $73 million above the expected operating expenditure. Sydney Water's future operating expenditure requirements reflect this change in capitalisation policy; and
- **net change in other inputs**: there have been a number of increases and decreases compared to the assumptions underlying the previous Determination. The net reduction over the period reflects significant savings in agency hire costs. Temporary savings in contractor and service costs were also achieved in 2003/04. The major items contributing to the increase in 2004/05 compared to the target include additional operational materials (+$2 million), increased property costs (+$8 million) due to security and maintenance and the rationalisation program.

It can be seen that if Sydney Water were able to maintain its expenditure excluding superannuation at 2003/04 levels ($759 million) then it would improve on the $765 million Tribunal target for 2004/05 by $6 million. However, there are valid reasons for the cost increases budgeted in 2004/05. Table 5 sets out reasons for the cost variation between 2003/04 and 2004/05.

Table 5: Explanation for cost variations 2003/04 to 2004/05

Expenditure	Reason for cost variation	Increase ($m)
Water treatment	Increased throughput, quality and rates, as discussed above	+$4
Maintenance	Changing soil moisture levels increasing leaks and breaks	+$3
DEC Licence fees	Externally set and accounting adjustments	+$4
Electricity usage	Systems growth and accounting adjustments	+$2
Demand management	Additional programs to meet Operating Licence targets	+$5
Property services	Rationalisation of property portfolio, maintenance and external costs such as land tax and rates	+$7
Other provisions	Workers' compensation and general insurance	+$12
Capitalisation	Impact of change in capitalisation policy as discussed above	+$13
Total change identified		**+$50**
Change as a percentage of comparable actual results 2003/04		**+6%**

Sydney Water considers the difference in operating costs between 2003/04 and 2004/05 to be within the normal range of variation for its operating expenses.

In summary, Sydney Water has, within a small margin of error, achieved the operating expenditure targets set by the Tribunal over the two year period. The differences from the Tribunal's targets are based on a prudent increase in operating costs driven primarily by redundancy costs and a change in capitalisation policy, offset by ongoing efficiencies.

5.2.2 Capital expenditure

The Tribunal expected Sydney Water to deliver savings of $36 million (3.5 per cent) ($38 million in 2004/05 dollars) on Sydney Water's requested capital expenditure for the period of the previous Determination. The Tribunal calculated Sydney Water's capital expenditure allowance on the following basis:

- all below ground asset renewal capital expenditure was allowed in full;
- all above ground asset renewal capital expenditure was allowed except for:
  - a proposed upgrade at the North Head Sewage Treatment Plant, as this was not in line with the priorities set by DEC (then Environment Protection Authority of NSW);
  - a portion of water above ground renewals capital expenditure, due to doubts about Sydney Water's ability to spend the proposed amount efficiently over the price path;
- growth capital expenditure was adjusted to bring it in line with historical growth in capital expenditure; and
- a 4 per cent efficiency reduction was applied to all remaining capital expenditure.

Current capital expenditure estimates indicate that Sydney Water will spend $1.026 billion over the period 2003/04 to 2004/05 or 1.7 per cent *less than* the Tribunal's target. In attempting to curtail its capital expenditure program, Sydney Water reviewed a number of projects which included discretionary elements (including North Head Sewage Treatment Plant upgrade and the South Western Sydney Sewerage Scheme). This ensured a focus on meeting mandatory standards and growth, in as efficient manner as possible while still meeting the basic objectives of the programs. This avoided exceeding or anticipating standards, and to ensuring that the projects were staged optimally. The savings identified in these projects were allocated to increased renewals expenditure, addressing the Tribunal's concerns in relation to ensuring adequate renewals were undertaken.

CASE STUDY – South Western Sydney Sewerage Scheme

The population served by Liverpool and Glenfield Sewage Treatment Plants is expected to increase from 215,000 to 350,000 by 2021. Given the environmental constraints on discharging wastewater in the area, the most cost effective means of managing additional wastewater is to transport it to the Malabar Sewage Treatment Plant (STP).

Planning for sewerage services for the Glenfield, Liverpool and Hoxton Park areas was undertaken during the 1990s. The objectives of the Georges River program were to service growth, improve wet weather performance of the system, allow for recycled water use, and reduce ocean discharges and treatment demands on the Malabar Sewage Treatment Plant.

The program was planned for delivery in two stages. Stage 1 (currently under construction) involved partial transfer of flows from the Hoxton Park area to Liverpool STP and minor amplification of the Glenfield and Liverpool STPs.

However, Georges River Project Stage 2 has been replaced by a suite of projects in Sydney's South West that reflect an ongoing commitment to servicing Sydney's wastewater needs while creating potential future recycling options.

By making better use of existing infrastructure and using the recycled water closer to where it is produced, around $90 million will be saved without compromising on the original commitment to provide for potential recycled water markets in the future.

The revised program includes the South Western Sydney Sewerage Scheme (SWSSS), amplification of Liverpool Sewage Treatment Plant (STP), transfer of flows from Holsworthy STP and the Hoxton Park area, and a proposed upgrading of the Glenfield Sewage Treatment Plant (STP) to service local development.

The development of the SWSSS in conjunction with the proposed upgrade of the Glenfield STP provides for potential recycled water use along the length of the new pipeline as well as in the new residential development areas around Hoxton Park.

The proposed recycled water scheme at Glenfield STP will target new recycling markets following the introduction of the Building and Sustainability Index (BASIX) water efficiency requirements for all new homes.

The SWSSS program is intended to service growth in the region and will also provide future reuse potential for industry, residential development and irrigators between Liverpool and Ashfield.

The project will ensure that Sydney Water meets all current environmental requirements while making better use of existing infrastructure.

Under the revised program, the proposed pipeline will run from Liverpool to Ashfield where it will tap into the existing Western Branch Main Sewer, which has sufficient capacity for approximately the next 20 years.

Offtake points are proposed to be built into this new pipeline at key locations for potential future customers to draw off treated wastewater.

Markets for the recycled water in the latter section of the originally proposed pipeline between Ashfield and Malabar have not been as strong as originally hoped.

In addition, the new proposal avoids significant social and environmental issues associated with running a pipeline through residential and wetland areas between Ashfield and Malabar.

The capital expenditure program delivered by Sydney Water over 2003/04 and budgeted for 2004/05 has delivered the outputs consistent with the program submitted to the Tribunal for the previous Determination. The key differences are:

- an increase in renewals expenditure due to:
  - an increase in the level of water mains renewals to support long-term asset renewal requirements and drought management initiatives;
  - an increase in sewer main renewal and rehabilitation as a result of improved asset condition information; and

Business performance over the current period

- acceleration of the work on Bondi Sewage Treatment Plant Reliability and Modernisation program to improve the efficiency of delivery;

- a reduction in forecast expenditure for wastewater due to:
  - review and optimisation (through staged delivery) of the South Western Sydney Sewerage Scheme (formerly Georges River Wastewater Strategy, see case study above);
  - delays in Illawarra Wastewater Strategy delivery due to inclement weather and contractual difficulties;
  - review and redefinition of proposed North Head Sewage Treatment Plant upgrade to focus on renewals, reliability and business efficiency components;
- a significant increase for corporate capital expenditure due to:
  - actual expenditure on borrowing cost for 2003/04 being $12 million more than forecast in the previous price path for 2003/04 and an expected $8 million more than forecast for 2004/05;
  - purchase of the Parramatta site for the proposed new Head Office cost $15 million more than was allocated for property investments; and
  - an increase in capitalisation of Sydney Water labour related to developer works and an increase in Sydney Water's contribution to works initiated by others, for example, the Roads and Traffic Authority for the Western Sydney Orbital road works;
- a reallocation of capital expenditure to the operational budget to better reflect the Tribunal's definitions.

In addition, there have been a number of minor adjustments due to a clearer definition of the capital works drivers in mandatory standards and growth. Sydney Water's approach to delivering capital savings through procurement and design efficiencies is discussed in Section 5.3.2.

Table 6: Sydney Water capital cost performance against Tribunal target 2003/04 and 2004/05 by driver

Expenditure ($million 2004/05 dollars)	**SW Submission (2003/04 and 2004/05)**	**Tribunal target (2003/04 and 2004/05)[1]**	**Sydney Water (2003/04 actual and 2004/05 budget)**
Water	172.3		178.5
Wastewater	814.2		676.8
Stormwater	24.2		25.9
Corporate	71.4		100.8
Borrowing costs	Distributed above		44.4
Total **Percentage variation against target**	**1082.1**	**1044**	**1026.4** **-1.7%**

Note:

1. The Tribunal did not specify the target by driver or activity.

Table 6 and Table 7 compare the capital investment program at the time of the previous Determination against the capital investment program delivered in 2003/04 and budgeted for 2004/05 by business activity and driver, respectively.[32]

As part of the prudential review of the capital expenditure program several assets were written down. This includes a portion of the planning work undertaken for North Head and the South Western Sydney Sewerage Scheme.

Table 7: Sydney Water capital cost performance against Tribunal target 2003/04 and 2004/05 by activity

Expenditure ($million 2004/05 dollars)	**Sydney Water Submission (2003/04 and 2004/05)**	**Tribunal target (2003/04 and 2004/05)[1]**	**Sydney Water (2003/04 actual and 2004/05 budget)**
Asset maintenance and Asset renewal/replacement	353		412.7
Growth	137.6		162.2
Mandatory standards (including Government Programs)	540		369.7
Other borrowing costs	51.5		81.8
Total **Percentage variation against target**	**1082.1**	**1044**	**1026.4** **-1.7%**

Note:

1. The Tribunal did not specify the target by driver or activity

Sydney Water has successfully achieved the capital expenditure targets set by the Tribunal over the two year Determination period without adversely impacting on the outputs and outcomes to be delivered. Sydney Water delivered savings by rescoping particular projects and delivering savings through procurement and innovative design. Sydney Water's future capital expenditure plan reflects Sydney Water's improved asset management processes and efficiency gains in procurement and design.

5.2.3 Revenue and return

At the time of the Tribunal's last Determination, overall revenue was projected to be $1.354 billion in 2003/04 and $1.386 billion in 2004/05. However, the ongoing drought and increasing levels of water restrictions since November 2002 have had a significant impact on water demand and consequently Sydney Water's revenue. Revenue was 6 per cent below the Tribunal's assumption in 2003/04 and is forecast to be 4 per cent below the Tribunal's assumption in 2004/05. Sydney Water's revenue over the two years is expected to be $137 million or 5 per cent below the revenue allowed by the Tribunal (see Table 8).

[32] The capital expenditure drivers agreed with the Tribunal are discussed in more detail in the context of future capital expenditure requirements in Section 6.2.

Table 8: Revenue assumptions and outcomes 2003/04 and 2004/05

Revenue ($million 2004/05 dollars)	**2003/04**	**2004/05**	**2 year total**
Previous Determination assumption	1,354	1,386	2,740
Actual Sydney Water forecast	1,271	1,332	2,603
Difference from target	**-83**	**-54**	**-137**
Percentage variation	**-6%**	**-4%**	**-5%**

The Tribunal's previous Determination allowed Sydney Water an expected real pre-tax return of 5.9 per cent in 2003/04 and 5.6 per cent in 2004/05. The Tribunal calculated a weighted average cost of capital (WACC) range of 5.2 per cent to 6.7 per cent, placing the allowed returns consistently below the midpoint of 5.95 per cent.

Sydney Water believes that this is unsustainable, particularly in the light of the debate surrounding the need to encourage more responsible water use, the use of pricing to achieve this and the need to invest heavily in a range of water and wastewater projects.

Sydney Water has not earned the returns allowed by the Tribunal over the current period. Table 9 presents the financial analysis assumed by the Tribunal in the previous Determination against the actual outcomes. As a result of the under-recovery of revenue, and the slight over-expenditure against the expected operating expenditure allowances over the period, Sydney Water's pre-tax rate of return was just 5.6 per cent in 2003/04 and is budgeted to fall to 4.6 per cent in 2004/05. The 2004/05 return represents a margin of around 1 per cent above the current risk free rate. This does not provide an adequate return on the community's investment.

Table 9: Actual versus forecast revenue requirements (pre-tax excluding capital contributions and unregulated income) 2003/04 to 2004/05

Financial year ending 30 June	**Allowed**		**Actual[4]**	
$million – nominal	**2003/04**	**2004/05**	**2003/04**	**2004/05**
Opening fixed asset value	7,005	7,558	7,018	7,545
plus net capital expenditure[1]	**458**	**454**	**459**	**458**
less disposals	(24)	-	(8)	(45)
less depreciation	(105)	(113)	(105)	(112)
plus indexation	224	234	181	193
Closing fixed asset value	7,558	8,133	7,545	8,039
Working capital (closing balance)	215	222	214	212
Total regulatory asset base	7,773	8,354	7,759	8,251
Operating expenditure	**798**	**810**	**739**	**850**
Depreciation	105	113	105	112
Expected return on assets	451	462	427	370
Expected revenue	**1,354**	**1,386**	**1,271**	**1,332**
Indexation of working capital[2]	6.6	6.6	5.4	5.3
Return on assets (%, real pre-tax)[2,3]	**5.9%**	**5.6%**	**5.6%**	**4.6%**

Source:

The Independent Pricing and Regulatory Tribunal (2003), Sydney Water Corporation: Prices of Water Supply, Wastewater and Stormwater Services from 1 July 2003 to 30 June 2005, Report No. 4, Appendix 6.

Notes:

1. Net capital expenditure is capital expenditure net of all capital contributions.

2. The indexation of working capital ($ value) is subtracted from the total expected return on assets to calculate the real return. The opening balance plus half of the change during the year is indexed, if working capital is included in the RAB.

3. The real return on assets is calculated on the average asset base for the year.

4. To calculate 2003/04 and 2004/05 actuals indexation is calculated based on actual rather than assumed inflation and depreciation and working capital are recalculated using the Tribunal's methodology as outlined in the Tribunal's model.

5.3 RESPONDING TO THE TRIBUNAL'S ASSESSMENT IN THE PREVIOUS DETERMINATION

Sydney Water has made significant progress against the areas identified for improvement or further analysis in the previous Determination. This section provides an overview of performance in the following areas:

- reduction in corporate overhead expenses;
- capital expenditure efficiency;
- asset management practices;
- discretionary capital expenditure; and
- other matters.

5.3.1 Reduction in corporate overhead expenses

Sydney Water has focussed considerable attention on achieving operating expenditure efficiency through a reduction in corporate overhead costs. Key initiatives include:

- a $9 million or 14 per cent reduction in Customer Services costs from 2001/02 through process reengineering, efficiency gains, outsourcing some functions and products, and reduced merchants' fees due to a revised banking contract;
- a $7 million or 16 per cent reduction in Information Technology costs from 2001/02, due in large part to reduction in agency hire and data management costs. Specific initiatives include introduction of a Standard Operating Environment and implementation of a selective outsourcing model and workforce plan that provides a more flexible lower cost workforce;
- the centralisation of corporate functions and property rationalisation. This centralisation will result in cost savings of up to $1.6 million in Communications and $0.9 million in Human Resources. Further savings from the restructuring of the corporate Finance function will reduce costs by $1.5 million or 8 per cent from 2005/06; and
- additional reforms have been undertaken to align future work programs with resource requirements in the areas of asset solution planning and environmental service provision, with forecast anticipated savings of $0.8 million.

Corporate overheads are budgeted to reduce by $29 million or 19 per cent from 2004/05 to 2008/09. These savings are included in Sydney Water's operating expenditure requirements for the review period.

CASE STUDY – Delivering savings in IT

In the past two years Sydney Water has saved up to $2 million per annum through the introduction of a Standard Operating Environment (SOE) for the computer network. The aim of the SOE was to provide all Sydney Water users with a standardised IT desktop environment that is easy to manage, costs less to administer and allows software to be upgraded quickly and automatically. The result is a reliable computing platform that vastly improves business efficiency.

One of the major benefits of the SOE is reduced cost for technical support. The SOE enables faster resolution of desktop problems with a remote feature, automatic upgrades of software and quick delivery of new applications by central control. This has led to a decrease in the number of calls logged to the Sydney Water Help Desk and saves more than 2,800 working hours on average every time an enterprise wide software installation or upgrade occurs. As a result, Sydney Water has been able to improve IT staff efficiency and has decommissioned infrastructure at some smaller sites.

As discussed in Section 2.3, Sydney Water has changed its approach to business planning, linking together budgeting and business planning into a more rigorous framework supported by a financial performance review process. This integrated methodology will deliver sustainable improvement in future years.

5.3.2 Capital expenditure efficiency

Sydney Water has delivered capital expenditure efficiency savings by reviewing project effectiveness and delivering savings in design and procurement.

Reviewing project effectiveness

Sydney Water reviews expenditure requirements as part of its annual business planning cycle to ensure that the optimal mix of projects is selected. The long lead times associated with many of Sydney Water's capital projects means that it is important to regularly review the projects to ensure priorities are addressed, and proposed scope of works remain appropriate.

Sydney Water's capital investment program aims to provide efficient and effective planning of limited capital resources by ensuring that there are clear and detailed links between assets and service delivery outcomes. All proposed capital investment items are identified under the seven investment drivers nominated by the Tribunal (see further discussion in Section 6.1). Outputs and outcomes of the capital investment programs are set out in asset plans. As part of the business planning process investment bids identified in asset plans are reviewed for alignment to corporate objectives and priorities. As required, these are prioritised on the basis of the risks associated with deferring the project.

Sydney Water undertakes strategic reviews of major servicing options at key project/program milestones to ensure the objectives, scope and preferred solutions are the most cost effective and efficient. This is required particularly where projects have a long lead time and both internal and external drivers may change over the life of the project.

CASE STUDY – North Head Sewage Treatment Plant upgrade

Sydney Water is investigating options to ensure the North Head Sewage Treatment Plant (STP) continues to operate reliably, in line with the environmental standards set by DEC.

A suite of four separate projects will include the construction of a recycled water facility to replace around 1.5 million litres of drinking water used at the plant each day and a new biosolids management facility.

The aim of this work is also to maintain current performance of the plant, improve the reliability of operation, protect beach water quality and ensure worker safety.

Sydney Water is currently undertaking a concept design for the licence compliance and reliability works at the plant. This is due for completion in late 2004, and the timing of the works will be determined in 2005, following the current Determination.

This program for North Head STP follows a revision of the initial Project North Head which proposed a major upgrade of the plant at a cost of around $225 million.

Project North Head was discontinued following a review of drivers, project costs and benefits at the first major project milestone.

DEC did not support Sydney Water's rationale for Project North Head on the basis that the current level of treatment combined with the ocean outfall was providing satisfactory environmental protection.

Based on this, the Tribunal was not persuaded the project sufficiently justified asking Sydney Water's customers to pay for broad environmental benefits which were over and above the licence requirements.

An examination was subsequently undertaken into the continuing need for work at North Head Sewage Treatment Plant, particularly in terms of meeting existing standards and growth.

This led to a separate group of four projects being identified. The preliminary total estimate for the four projects is $106 million, a reduction of $119 million on the original estimate considered for the previous Determination.

Sydney Water is committed to informing the community and local stakeholders on the nature and timing of this new program of work.

Financial appraisals and, where appropriate, economic appraisals, are used to assess the veracity of capital investment decisions. Life cycle costing is carried out in the project appraisal phase and incorporated into financial appraisals. Activity based costing at an asset level will assist this process as trends are collected.

Post Implementation Reviews (PIRs) are undertaken to:

- confirm the process achieved what was asked for; and

- confirm the process achieved what was needed.

The lessons learned from PIRs are incorporated into the consideration and development of relevant new projects. Application of these tools and processes ensures that the 'best value for money' is achieved.

Design and procurement efficiency

The majority of Sydney Water's capital investment program is subject to competitive tendering. Sydney Water has driven further significant improvements in the efficiency with which capital works are procured through:

- the bundling of work into increasingly larger packages to reduce internal and external contracting costs and program management costs and to provide more attractive packages to the external market;
- emphasising the importance placed on the ability of contractors to bring innovative cost savings to projects;
- adoption of more collaborative contracting models where appropriate, including risk sharing alliances, performance incentive contracts and partnering arrangements; and
- a move towards relationship contracts including alliances and incentivised contracts with risk/reward components to create a cooperative rather than an adversarial delivery environment.

More specifically, to achieve 'value for money' Sydney Water uses the following approaches for the two broad contract types:

- conventional contracts (eg. construct only, design development and construct, design novate and construct, and design and construct):
    - bundling of similar work to obtain economies of scale and significant reduction in the number of contracts that need to be managed;
    - involvement of operation and maintenance personnel early in developing specifications to minimise scope creep and variations;
    - competitive tendering;
    - use of incentive provisions; and
    - nominated supplies/suppliers where goods or services are being obtained under separate Government Contracts (eg. pipes, pumps) where it adds value;
- relationship type contracts:
    - rigorous selection process to select the most appropriate industry partner/s;
    - intensive commercial negotiation phase supported by internal and industry experts ensuring competitive margins (profit, overheads, etc);
    - independent expert validation of value for money for the target cost estimates; and
    - a significant proportion of contract value is delivered through sub-contracts which use competitive tenders to ensure value for money.

Table 10 shows the targeted and forecast efficiency gains in capital improvement over the current regulatory period. Allowing for changes in borrowing costs Sydney Water has reduced program costs significantly without affecting the outcomes to be delivered.

Table 10: Targeted and forecast efficiency gains in capital procurement 2003/04 to 2004/05

Project/Program ($million 2004/05 dollars)	Type of contract	Forecast capital expenditure (2003/04 – 2004/05)	Targeted efficiency gain (2003/04 – 2004/05)	Forecast efficiency gain (2003/04 – 2004/05)
SPS Upgrade	Alliance	120	10	13
Bondi STP RIAMP	Alliance	50	3	5
SWSOOS Risk Reduction	Incentivised Design and Construct	54	4	4
PSP – Oaks/Oakdale	Various	7	2	2
Sewer renewals	Probable Incentivised Design and Construct	60	6	6
Water Main renewals	Probable Incentivised Design and Construct	100	9	9
Stormwater renewals	Design and Construct	7	1	0.4

On average, over the next Determination period, it is anticipated about 20 per cent of the value of the proposed capital investment would be delivered through relationship type contracts and the balance 80 per cent through the many variants of conventional contracts. Potential areas for efficiency gains have been identified and include renewals at sewage treatment plants, water main renewals and the PSP in particular.

Within the tendering process for capital works Sydney Water encourages innovation in design and technology, as a further tool to ensure efficient capital expenditure.

CASE STUDIES – Innovation in design

Reduction in sewage pumping station design capacities

In the past Sydney Water's sewage pumping stations were designed to match theoretical ultimate peak wet weather flows, which may or may not occur during the pumping station's lifetime. This has frequently resulted in overdesign, inefficient pumping during normal conditions and other problems. The peaks in wet weather flows are now contained within the pumping station's emergency storage structures normally provided to prevent dry weather overflows. This has significantly reduced the size of the pumping stations' wet wells, pumps and motors, power supply, rising mains and receiving assets. About $8 million has been saved on the Rouse Hill project alone by adopting this design methodology.

Elimination of sewage pumping stations by micro tunnelling and directional drilling

Micro tunnelling and directional drilling techniques have been used to reduce the number of pumping stations either through combining two or more sub-catchments or by draining directly to main sewer carriers. The most significant example of this is in The Oaks–Oakdale project where the number of pumping stations was reduced from nine in the original concept down to only two. The net capital costs saved were $2 million while the annual operating cost savings amount to $140,000.

5.3.3 Asset management practices

Sydney Water has introduced a number of measures to improve its maintenance and renewals decision making, and the overall stewardship of its asset portfolio. As discussed in Section 2.3 Sydney Water has developed and implemented an Asset Management Framework that sets out the philosophy and approach by which it aims to manage its assets to achieve an appropriate balance between service levels, financial return and risk – throughout all stages of the asset life cycle. The framework outlines the links between asset

management and other planning structures, as well as describing the key instruments and support tools (such as asset management plans and business cases) that are used.

Asset management plans are a key element of Sydney Water's asset management capability. A standard process has been introduced for preparing asset management plans as part of the business planning cycle, and plans have been produced in a standardised form for each asset class and major facility. A major objective of these plans (and supporting processes) is to substantiate the veracity of maintenance and renewal decisions, and to improve the quality of asset decisions, by ensuring that all relevant options are explored, and that rigorous evaluation processes are applied.

Maintenance and renewals planning

Sydney Water has been improving its approach to maintenance and renewals planning across all of its asset classes. A common feature of these improvements is the use of risk analysis as a basis for categorising assets and determining appropriate inspection and renewal strategies.

Pipelines

The two most important asset classes for Sydney Water in terms of asset value are the water and wastewater (sewer) pipes. Accordingly, particular attention has been focused on improving performance and capability assessment, and planning, for these two asset classes.

For water mains this has included the adoption of more detailed and technologically advanced methods of condition assessment and failure prediction (see case study below). Other improvement initiatives include:

- adoption of consistent life cycle management policies for water mains throughout the water supply system; and
- introduction of a new forward planning tool to forecast water pipe renewals. This decision support software, KANEW, applies statistically based analysis to the inventory of water mains, taking account of age, pipe material and estimated life span data, to predict the lengths of different categories of pipe to be rehabilitated or replaced on an annual basis. Although a 'macro' model that does not identify specific pipes to replace, it is an important tool for ensuring sufficient provisions for renewals *in aggregate*, each year.

For sewer mains, Sydney Water has improved its asset management approach by putting increased focus on the monitoring and gathering of condition data, and the more systematic assessment of asset risks, as the basis for deciding maintenance and renewal priorities.

Much of this new approach was developed as part of a recent major inspection and rehabilitation planning project on Sydney Water's largest sewer system, the Southern and Western Suburbs Ocean Outflow Sewer (SWSOOS). This project, conducted jointly with external consultants, has led to a number of improvements in inspection regimes and risk analysis methodologies, which are being incorporated into Sydney Water's standard asset management practices.

This has led to the development and use of detailed planning tools, called Sewer Trunk Asset Management Plans (STAMPs) for large trunk pipe elements and SCAMPs for smaller reticulation pipes, which provide a template for condition and performance based works planning for the respective sewer types.

CASE STUDY – Improving the efficiency of critical water mains renewals

The most critical of Sydney Water's water mains are managed according to a 'failure avoidance' strategy. As most critical mains are buried and in varying soil and moisture conditions, assessment of physical condition and hence prediction of likely failure has traditionally been difficult, as has identification of the specific sub-sections of pipe that require renewal.

Sydney Water is now developing and applying new techniques to more accurately predict failures and target renewals. Its new critical water main renewal strategy involves three stages of risk assessment, starting with desktop analysis and progressing through successively more detailed levels of on-site condition assessment, including use of advanced techniques such as Linear Polarisation Resistance soil testing.

A pilot project has confirmed that this approach will enable the most critical and high-risk sections of pipeline to be identified, thus reducing the likelihood and additional cost of replacing neighbouring sections of pipe that don't need replacement. Although the full benefits of this approach will be confirmed only after more extensive application, indicative savings of 30 per cent of renewal length are anticipated, representing a significant contribution to capital expenditure efficiency.

Facilities and plant

Over the past two to three years Sydney Water's maintenance planning function has made greater use of systematic processes and risk based analysis tools such as Reliability Centred Maintenance (RCM) and Failure Mode Effects and Criticality Analysis (FMECA), for its mechanical and electrical plant assets.

Further initiatives in relation to equipment standardisation (for example, use of standardised pump types), technology improvements for condition monitoring and condition based maintenance, and improvements in asset performance analysis tools, have resulted in improved maintenance planning and cost efficiencies.

A number of strategies such as outage management and contingency arrangements (for example back-up plant) have been developed as alternatives to capital investments such as renewal or upgrades.

Sydney Water has identified the need to implement a more stable and robust program of major periodic maintenance for its major facility assets. Maintenance of this type often requires large expenditures on a cyclical basis, but can be optimal from a life cycle perspective due to economies of scale that can be achieved, and by preventing deterioration of the asset to a point where reinstatement costs are multiplied. An appropriate ongoing program of major periodic maintenance has been incorporated in electrical and mechanical asset plans and budgets from 2005/06 onwards.

Comparative practice and peer review

In an effort to assist and hasten the development of its AMPs, processes and practices, Sydney Water has sought outside input and comparison by participating in a number of external benchmarking studies, inviting peer review of its processes, and engaging external consultants to review or contribute to its practices. Collectively, these reviews, collaborations and benchmarking initiatives have been valuable in identifying areas of strength and weakness, opportunities for improvement and identifying best practice.

Two recent examples were undertaken as part of the WSAA Asset Management Benchmarking Program. These reviews included:

- a review of asset maintenance processes undertaken in 2000 (civil maintenance) and 2001 (mechanical and electrical maintenance); and
- a review of asset management processes undertaken in 2004, in which over 20 agencies participated.

Sydney Water performed strongly in each review. Indeed, Sydney Water was identified as a leader in several functions and ranked in the top five organisations for the remainder of the processes evaluated (as identified in Figure 3). Other examples of external peer review and collaboration include:

- joint development of the SWSOOS sewer planning project with SKM (2004);
- external review of maintenance program practices by Halcrow Pacific (2004);

- Criteria Review Committees, comprising both internal and external representatives, review the wastewater models and SCAMPs process (ongoing); and
- review of Condition Based Asset Valuation by WS Atkins (2004).

Asset management improvement program

As part of its ongoing monitoring and review process, a number of areas for improvements to plans, processes and practices have been identified, and in many cases already implemented. This includes some of those activities described above. Many of these initiatives form part of a formal and comprehensive asset management improvement program that has been ongoing since 2000. Key past and future stages are illustrated in Figure 5.

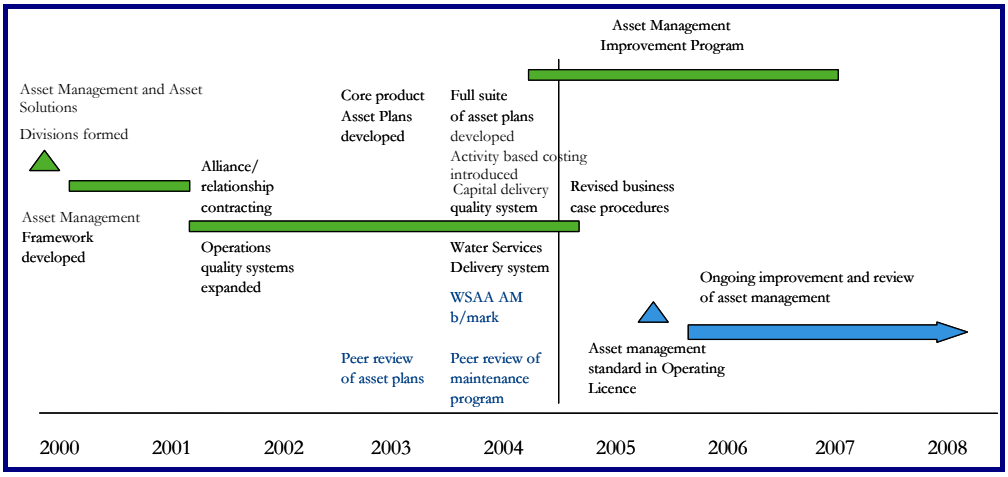

Figure 5: Development of Sydney Water's asset management planning process

The need for, and benefits from, a robust improvement program will increase with the proposed introduction of regulation of asset management in Sydney Water's Operating Licence.[33] Specific elements of the future phases of the program are planned to include the following:

- roll-out of STAMPs and SCAMPs throughout the network;
- renewal of water modelling tools and models;
- integration of asset condition failure likelihood information systems with asset and equipment register and geographic information system (GIS);
- risk management information, including costs associated with asset failure or under-performance, and integration with asset information systems; and
- completion of documentation of asset related risk assessment, decision making and management processes, and incorporation in management systems.

5.3.4 The delivery of outcomes above mandatory standards

Sydney Water's operations and expenditures are, on the whole, aimed at meeting, and not exceeding, its defined regulatory performance standards, particularly those customer service standards regulated by the Tribunal and environmental standards regulated by DEC. Accordingly, virtually all of the capital works proposed by Sydney Water have clear drivers related to existing or proposed standards of service it is required to meet. However, under some circumstances, Sydney Water undertakes projects or investments that will sometimes produce outcomes that exceed these standards.

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[33] GHD Pty Ltd, *Asset Management Requirements for Operating Licences – Sydney Water and SCA*, prepared for the Tribunal, July 2004.

It would seem that the Tribunal implicitly defines any expenditures which cause performance outcomes to exceed regulatory standards as 'discretionary', unless Sydney Water can demonstrate a compensating benefit – such as customer willingness to pay for this increased service – or a convincing reason to do so. In the previous Determination, the Tribunal identified several projects and expenditures that it considered failed this discretionary expenditure test.

However, it is Sydney Water's view that is does not often consciously decide to spend money on delivering standards of service that exceed those set by statute. Having said this, Sydney Water's proposed capital investment program includes a project that may be considered to be discretionary under the Tribunal's definition. This project involves proposed improvements to water quality in Alexandra Canal. As a result of discussions and negotiations with DIPNR's South Sydney Development Corporation, Sydney Water has committed to spending $3 million on water quality improvement works, including construction of gross pollutant traps. These works support the Development Corporation's Alexandra Canal Water Environment Plan and its vision to rehabilitate the canal to help promote development in the area. Sydney Water believes that even though this project is not directly driven by a specific regulatory standard, the organisation has committed these resources because it believes that it is consistent with the community's expectations. It is proposed that the scope of the project be reviewed in the business case presented to the FPRC.

More generally, Sydney Water plans a range of other investments that are expected to deliver outcomes above mandatory standards. However, Sydney Water believes that it would be incorrect for the Tribunal to consider these projects to be illegitimate. This is because for these projects the delivery of additional standards is a strict by-product of undertaking a project because it is economically sensible to do so. In general, these projects aim to improve system reliability, to meet existing standards of service and anticipated requirements for growth. Given the lumpiness of these investments, a by-product of these investments is an improvement to service standards elsewhere in the system (that is a positive externality). Sydney Water is confident that these projects will withstand external scrutiny.

5.3.5 Other matters

Sydney Water has responded to the other matters raised by the Tribunal, and more information is provided throughout this submission and its attachments. Table 11 identifies these other matters, and references the further discussion in this submission.

Table 11: Other matters raised by the Tribunal

Topic	Summary	Discussion
Refine service quality indicators	System performance indicators finalised, discussions on customer and environmental indicators continuing	Appendix B
Economic level of leakage	Sydney Water has undertaken projects to identify an economic level of leakage	Appendix B
Water recycling strategy and pricing principles	Sydney Water is developing a water recycling strategy and pricing principles	Section 8.1
Developer service charges	Sydney Water has forecast developer charges for the current period Sydney Water has undertaken an audit of recovery of developer service charges	Section 6.1
Demand forecasting	Sydney Water has developed a robust approach to demand forecasting using the end use model	Section 7.1
Billing of multiple building dwellings and tenant billing	Apportioned billing to be introduced as a demand management initiative Tenant billing proposal has been reviewed Amending metering policy to ensure all new multi-dwelling properties have separate unit metering	Appendix B Appendix B Appendix B
Blue Mountains septic pump out services options	Program to be retained for customers where sewer services are not available with tariff restructure Proposal for modifying the Blue Mountains pump out service developed where sewer services available	Appendix B
Minor service extension methodology	Implemented via connections policy for the provision of water and sewer services, implemented in March 2004	Appendix B

6 Revenue requirements

Sydney Water endorses the Tribunal's building block approach to determining Sydney Water's revenue requirements.[34] This section presents the key building blocks used to determine the revenue requirements, and Sydney Water's revenue entitlement calculated using these inputs. It begins by outlining Sydney Water's cost recovery to date and its capital and operating expenditure requirements going forward before discussing the Tribunal's determination of an appropriate rate of return on its investment. It then presents Sydney Water's revenue requirement in light of these requirements.

As outlined in Sections 2.3 and 5.3.3 Sydney Water's expenditure requirements are driven by its whole of life approach to managing its asset base. This approach ensures that expenditure is minimised over the life of the asset.

Based on the revenue requirements set out in this Section, these expenditures result in real annual price increases of 2.6 per cent to cover the cost of servicing Sydney Water's existing and new assets plus 0.8 per cent to cover Sydney Water's costs in implementing the Metropolitan Water Plan. Sydney Water acknowledges the Tribunal's role in determining an appropriate return on this investment, which will contribute to the real annual price outcome over the next four years.

6.1 SYDNEY WATER'S COST RECOVERY

In recent years there has been a significant reduction in Sydney Water's revenue collections compared to several broader economic indicators. Revenue growth has not kept pace with the substantial growth in the ability of consumers and business to pay. Overall, Sydney Water's total revenue per property has declined by 17.1 per cent in real terms since June 1998. Revenue per non-residential property has declined by 31.5 per cent in real terms since 1998 and revenue per residential property has declined by 9.0 per cent in real terms since 1998 (see Figure 6). This trend is in contrast to general economy trends. For example, compared to June 1998, the costs of water and sewer services to consumers Australia-wide have increased by around 1.4 per cent in real terms up to June 2004.

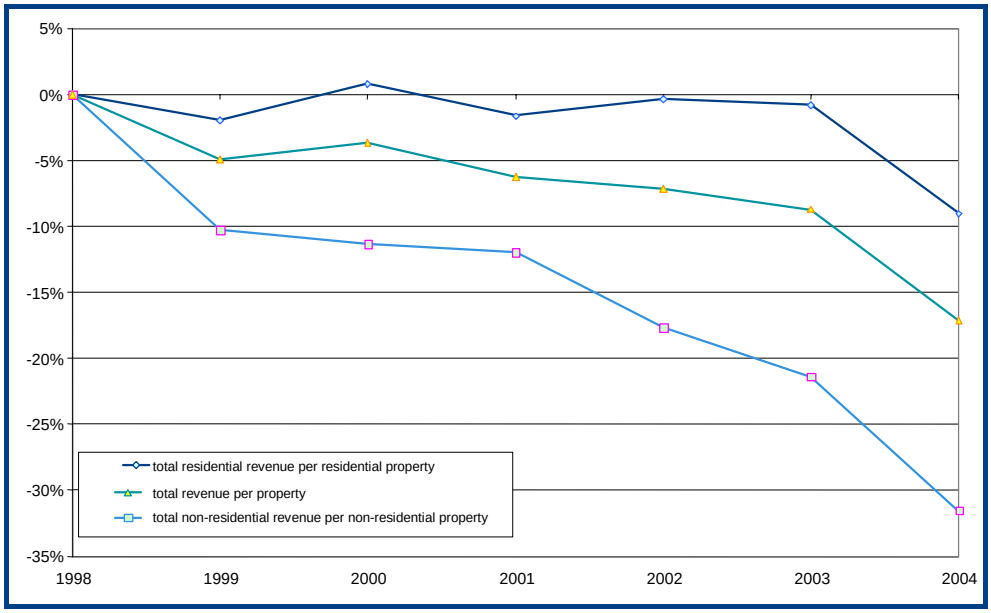

Figure 6: Sydney Water revenue trends per property 1998/99 to 2003/04

[34] The Tribunal, 'Appendix 4 Building Block Methodology and Incentive Regulation using CPI 6 X' *Sydney Water Corporation, Prices of water supply, wastewater and stormwater services – Prices from 1 July 2003 to 30 June 2005*, May 2003.

Since the Tribunal began regulating Sydney Water's prices in 1993 customer ability to pay has increased while Sydney Water's revenue has been declining:

- for non-residential customers, business profitability (measured by the total gross operating surplus (GOS) from all economic activity in NSW) has increased by 39.2 per cent in real terms between 1992/93 and 2002/03. Over the same period, Sydney Water revenue per non-residential property has declined by 66.6 per cent in real terms. Comparing GOS against Sydney Water's revenue per non-residential property, Sydney Water revenues have, in effect, declined by 100.8 per cent in real terms since 1993 (see Figure 7); and
- for residential customers the purchasing power of the average wage earner in NSW (measured by the average weekly ordinary time earnings in NSW) have increased by 27.7 per cent in real terms between 1992/93 and 2003/04. Over the same period, average revenue per residential property collected by Sydney Water has fallen by 5.4 per cent in real terms. Relative to the growth in employee purchasing power, Sydney Water revenues have, in effect, declined by 33.1 per cent (see Figure 8).

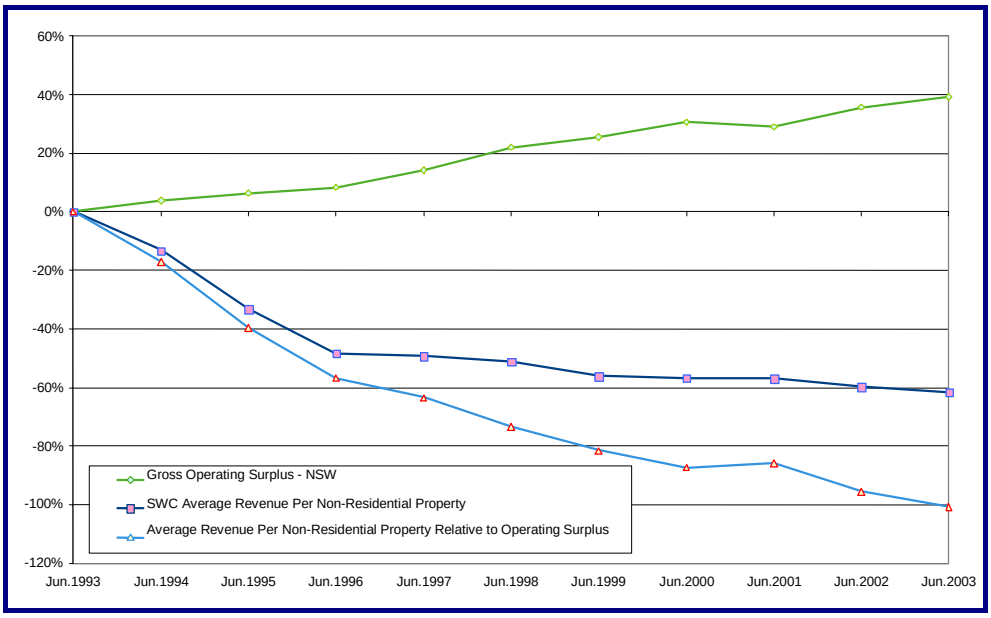

Figure 7: Sydney Water revenue per non-residential property relative to gross operating surplus 1992/93 to 2002/03

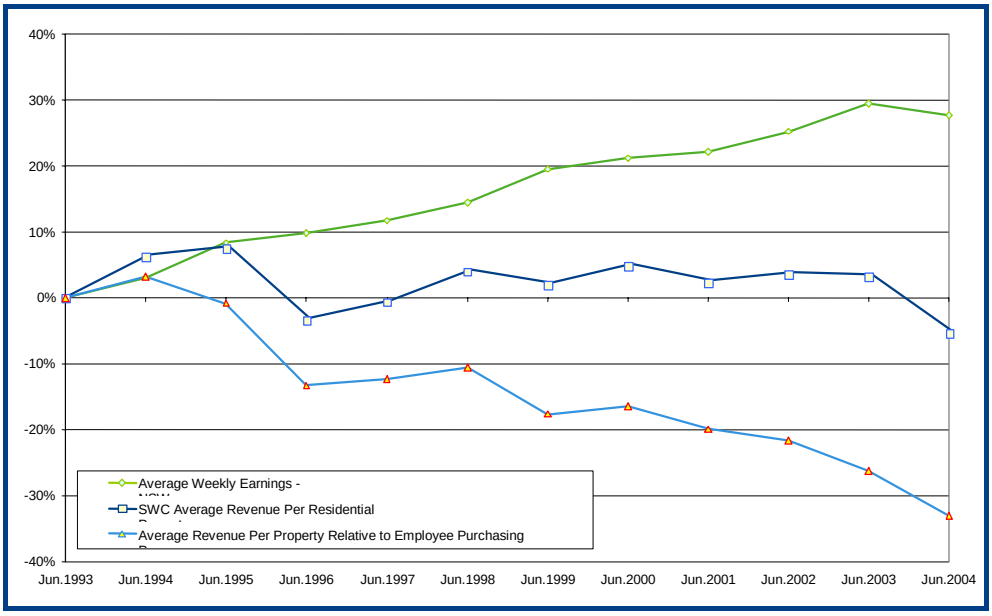

Figure 8: Sydney Water revenue per residential property relative to average weekly earnings 1992/93 to 2003/04

This reduction in revenue has been supported, in part, by a write down of Sydney Water's assets. In 1995/96 the Tribunal calculated an opening regulated asset base (RAB) for Sydney Water of $5.1 billion, compared to Sydney Water's total asset value of $13.3 billion at the time. Sydney Water's RAB was then recalculated in 1999/00 to be $5.4 billion, a write down of over 50 per cent compared to Sydney Water's written down book value of $12.6 billion. If prices are not set to ensure customers pay the true cost of meeting their demand, including an appropriate rate of return, further asset write downs are likely.

6.2 CAPITAL EXPENDITURE

This section summarises Sydney Water's capital expenditure requirements over the four year Determination period. It outlines the forecast capital expenditure requirements and the service outcomes delivered, before discussing the key associated uncertainties.

6.2.1 Overview

Based on the investment requirements identified in the asset plans, and taking into account additional demands created by growth, improved standards and NSW Government programs, Sydney Water will need to invest approximately $2.6 billion over the next four years to meet the required service outcomes.

Table 12 presents Sydney Water's planned capital investment from 2005/06 to 2008/09 on the basis of the key drivers identified by the Tribunal. This proposed program represents a shift towards increased renewals and reliability expenditure to support existing mandatory standards, and a sustained program of investment to service growth in the Sydney region. Each of the key drivers is discussed in more detail below.

Table 12: Sydney Water's proposed capital expenditure 2005/06 to 2008/09 by driver

Expenditure ($m - 2004/05 dollars)	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**Total**
Existing mandatory standards	323	308	281	288	**1,201**
Growth	188	256	254	138	**836**
New mandatory standards	45	50	64	73	**232**
Discretionary capital expenditure	3	0	0	0	**3**
Business efficiency	21	17	16	17	**71**
NSW Government programs	72	60	35	10	**177**
Borrowing costs	20	20	20	20	**80**
Total	**672**	**711**	**670**	**547**	**2,600**

6.2.2 Existing mandatory standards

Capital expenditure is required to ensure Sydney Water continues to meet its existing mandatory standards. This includes:

- the renewal or rehabilitation of assets that have reached the end of their useful life, or are no longer able to deliver at the required service level; and
- improving the reliability of assets to ensure compliance with existing mandatory standards.

Capital expenditure on existing mandatory standards accounts for nearly half of Sydney Water's expenditure requirements over the proposed Determination period. Key programs include:

- renewal of reticulation and critical water and sewer mains;
- Bondi Sewage Treatment Plant Reliability Improvement and Modernisation Program;
- North Head Sewage Treatment Plant Performance and Reliability Program; and
- SWSOOS Risk Reduction Program.

Sydney Water's capital expenditure forecast for existing mandatory standards represents a significant increase over the levels proposed in the previous Determination. Improved asset management practices have highlighted the importance of moving to an appropriate level of renewals expenditure over the medium to long term consistent with Sydney Water's aging asset base. Existing standards expenditure in 2005/06 is forecast to be $323 million, a significant increase over historical levels and a 28 per cent increase over budgeted expenditure for 2004/05.

The service outcomes that will be delivered for $1.2 billion over the period are summarised below.

Asset renewal and reliability

- Water
  - Reticulation water mains – replacement of over 300 km of pipeline by 2008/09, which will help ensure that Sydney Water continues to meet its standards for planned and unplanned service interruptions. By targeting mains sections that have experienced repeated failures, this work will also reduce the likelihood of recurring problems in any particular local area while also reducing overall maintenance costs.
  - Critical water mains – replacement of over 40 km of critical water mains nearing the end of their service life. Given the potential for property damage and customer inconvenience as a result of critical mains failures, this work aims to minimise such failures.
  - Water mains telemetry and modelling – development of new water network models, renewal of aging Integrated Information Control and Telemetry Systems, renewal of Supervisory Control and Data Acquisition systems at three water filtration plants and replacement of aging water flow meters.
  - Water pumping stations – replacement of mechanical and electrical components to maintain system performance at water pumping stations across the water supply network.
  - Water filtration plants – renew equipment at the Cascades, Nepean, North Richmond, Orchard Hills and Warragamba plants and installation of reservoir mixers and chlorine analysers to maintain the high standard of water quality produced by Sydney Water's water filtration plants.
  - Meter replacement – Renewal of over 500,000 customer water meters by 2009/10 to ensure reliability of consumption information.
  - Reservoirs – refurbishment of 14 water reservoirs to reduce earthquake vulnerability.
  - Water pressure – remedial works to improve water pressure at approximately 3,000 properties that have experienced poor pressure incidents.
  - Water continuity – upgrades to the water distribution system to provide additional service reliability. This work will involve improvements including additional water mains and pumping stations to allow for water to be diverted.
- Wastewater
  - Critical sewer mains – rehabilitation of over 40 km of concrete sewers will be completed by 2008/09.
  - Sewage treatment plants and sewage pumping stations – renew equipment that has reached the end of its service life at Bombo, Bondi, Cronulla, Glenfield, Liverpool, North Head, North Richmond, Picton, St Mary's and Warriewood to support compliance with environment protection licences.
  - Sewer overflows to private property – over 300 km of pipes will be relined to reduce overflows in repeatedly affected customer homes or private property.
  - Sewage treatment plants biosolids management – replacement of North Head biosolids facility.
- Stormwater
  - Stormwater pipes and channels – renewal and rehabilitation of approximately 4 km of pipes and channels.

CASE STUDY – Bondi Sewage Treatment Plant

A reliability and improvement project has been initiated for the Bondi Sewage Treatment Plant. Of a total budgeted expenditure of $95 million, approximately $32.4 million is expected to fall within the Determination period.

Assets at Bondi Sewage Treatment Plant have significantly deteriorated due to historically low levels of renewals. In its present condition risks surrounding the plant's operations are increased which is why it's imperative that it be restored to reliable working condition. A program was formulated based on a comprehensive risk management study carried out in October 2000 to identify the key risks to maintaining the current performance standards. The work does not necessarily include replacing 'like with like' as the opportunity has been taken to improve aspects of the design to enhance efficiency of operation and to meet current standards, including:

- modernising existing assets particularly in the older parts of the plant;

- providing an adequate level of automation to substantially reduce the current high level of manual work; and

- reducing occupational health and safety risks.

6.2.3 Growth

Growth capital expenditure is designed to meet the requirements of new customers or the increased requirements of existing customers. Large increases in growth expenditure to service new urban development are expected in the four years from 2005/06. These increases are largely due to the new infrastructure required to service the proposed northwest and southwest sector greenfield release areas. This will require investment of more than $1.5 billion for new water and sewerage infrastructure over the next 30 years and also increased provision of recycled water schemes to achieve the NSW Government's water conservation goals for new development (BASIX). Key programs for servicing growth include:

- continued implementation of works identified in Sydney Water's 2000 to 2005 Development Servicing Plans;
- installation of major new systems in the northwest and southwest sectors;
- connection of new recycled water customers (potable water replacement schemes); and
- provision of new and amplified services to cater for growth in the Hoxton Park release area, including the construction of the Liverpool to Ashfield sewage transfer pipeline.

Developer charges are levied on developers for the provision, or upgrading, of water supply, sewerage and drainage services for new developments. Table 13 below shows that over the price path period Sydney Water expects to receive $238 million from developers as a partial recovery of growth capital expenditure. On average, developer charges generate $60 million of revenue each year of the Determination. Of this, approximately 60 per cent (or $33 million) represents a recovery on existing assets. This funds around 28 per cent of the developer related growth capital expenditure over the price path period. In accordance with the recovery methodology, the developer contributions attributable to this increase will lag Sydney Water's growth-related expenditure, creating a medium-term disparity in cash flow which Sydney Water must manage using other capital sources. Moreover, cash contributions received from developers are subject to significant year-on-year volatility relating to broader economic circumstances and developer activity.

Table 13: Developer cash contributions 2005/06 to 2008/09

Expenditure ($million 2004/05 dollars)	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**Total**
Developer cash contributions	54	61	66	57	**238**

The service outcomes that will be delivered over the period are:

- Augmentation of existing and construction of new mains, pumping stations, reservoirs and treatment facilities to meet growth in Greenfield and infill areas, including Hoxton Park, Warriewood, St Marys and Penrith areas, Rouse Hill, North West and South West sectors, Elderslie and Spring Farm and Shellharbour.
- Extension of recycled water schemes to existing large water users to provide water savings.
- South Western Sydney Sewerage Scheme – construction of the Liverpool to Ashfield pipeline, extending the existing trunk system by approximately 24 km to transport wastewater from new growth areas in South Western Sydney, thereby also providing a potential source of effluent suitable for recycling to industry along the pipeline and avoiding the high cost of discharging effluent into rivers.

6.2.4 New mandatory standards

Additional capital expenditure is required to deliver new mandatory standards enforceable by Sydney Water's regulators. The main expenditure driver in this category are the mandatory standards set in Environment Protection Licences, including the articulation of the next five year tranche of abatement measures and targets set against the long-term overflow abatement goals.

Overall the service outcomes that will be delivered over the period are:

- Water
  - Water mains (pressure management) – reduce water pressure in areas where excessive pressure is causing greater than average levels of mains breaks, leakage and associated failures to improve service reliability and reduce losses through water mains failures.
- Wastewater
  - Sewer overflow abatement – rehabilitation and augmentation of the sewerage network to meet environment protection licence requirements.
  - Sewage treatment plants – finalisation of the Illawarra wastewater strategy to meet increased standards of effluent discharge.
- Stormwater
  - Stormwater Environmental Improvement Program (SEIP) – Installation of gross pollutant traps and wetlands treatment solutions to improve stormwater quality under the SEIP.

6.2.5 Above mandatory standards

As discussed in Section 5.3.4, Sydney Water's capital expenditure program is aimed at delivering mandatory standards, however, some capital expenditure is planned to deliver outcomes in excess of mandatory standards. Sydney Water is proposing to undertake one discretionary capital expenditure project, the $3 million improvement of the Alexandra Canal in 2005/06. As a result of negotiations with DIPNR's South Sydney Development Corporation, Sydney Water has committed to water quality improvement works in the Alexandra Canal, including construction of gross pollutant traps. These works support the Development Corporation's Alexandra Canal Water Environment Plan and its vision to rehabilitate the canal to help drive development in the area.

6.2.6 Business efficiency

Business efficiency investments improve the efficiency of service delivery through process redesign or improved business support tools and assets. These investments are justified on the grounds of expected reductions in operating expenditure, which are reflected in future operating expenditure forecasts and support other business objectives. Key programs include

energy efficiency projects, the construction of rechlorination units within the water supply system to replace manual dosing and rationalisation of depots and offices.

CASE STUDY – Energy efficiency

Sydney Water's capital program includes a small suite of energy efficiency projects aimed at optimising existing assets through incremental investment in retrofits and improvements to existing processes and systems. An expenditure of $7.5 million is planned over the four year period. Where technically and economically feasible, projects are likely to include optimisation of aeration and blowers at sewage treatment plants, the installation of jockey pumps and variable speed drive controls at large sewage pumping stations and sewage treatment plants.

It is projected that the energy efficiency program will result in a 10 per cent saving in energy consumption over a 10 year period based on present energy consumption patterns. Savings of $2.2 million per annum are expected by 2008/09. These savings will help to offset the increase in energy expenditure that will result from an increase in the electricity prices expected over the period. Even more significant savings may be possible through pro-actively optimising future plant and technologies. A program is in place to help identify these opportunities.

6.2.7 NSW Government programs

Capital expenditure is required to deliver the Priority Sewerage Program (PSP) – the backlog sewer program. The expenditure over the period reflects Stage 1 of the program, covering Mulgoa, Wallacia, Brooklyn/Dangar Island and Upper Blue Mountains and early planning for Stage 2.

The specific service outcomes that will be delivered from capital expenditure under the NSW Government programs capital include providing services to over 5,800 lots in the Upper Blue Mountains (which includes Mount Victoria, Medlow Bath and Blackheath), Brooklyn and Dangar Island, Menagle, Mulgoa/Wallacia/Silverdale, Jamberoo, Oaks/Oakdale, Belimbla Park, and Illawarra Northern Towns.

6.2.8 Borrowing costs

Under current accounting standards Sydney Water is required to capitalise interest during construction for its qualifying assets. Proposed changes in accounting standards are likely to change this treatment, however, current standards have been adopted in the preparation of the forecasts. Borrowing costs are expected to remain constant in real terms throughout the Determination period.

6.2.9 Capital expenditure by activity

Table 14 shows Sydney Water's proposed capital expenditure over the Determination period by activity.

Wastewater expenditure accounts for over half of Sydney Water's forecast capital expenditure. This is consistent with the importance of maintaining and improving Sydney Water's wastewater asset base, and reflects the investment required to deliver the mandatory overflow abatement targets in the Environment Protection Licences and the NSW Government's PSP. There is also an increase in recycled water investment compared to previous periods, reflecting Sydney Water's recycled water strategy and the NSW Government's Metropolitan Water Plan.

Table 14: Sydney Water's proposed capital expenditure 2005/06 to 2008/09 by activity

Expenditure ($m - 2004/05 dollars)	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**Total**
Water	158	170	175	150	**653**
Recycled Water	45	74	54	43	**216**
Wastewater	383	391	381	296	**1,451**
Stormwater	13	6	6	6	**32**
Corporate	73	69	53	53	**248**
Total	**672**	**711**	**670**	**547**	**2,600**

6.2.10 Delivering efficient capital expenditure

Over 90 per cent of Sydney Water's capital expenditure over the Determination period will be externally procured. Figure 9 shows the breakdown of Sydney Water's capital expenditure over the Determination period. Sydney Water's in-house capital expenditure relates primarily to project management and some renewals capital expenditure. Capital expenditure is efficiently sourced according to Sydney Water's procurement guidelines.

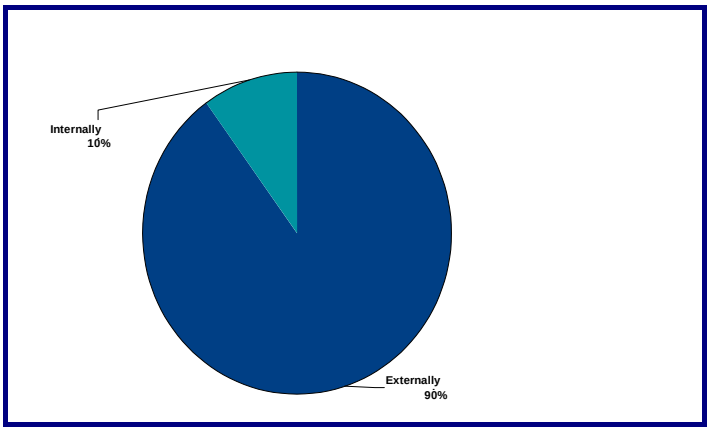

Figure 9: Capital expenditure procurement over price path period

Sydney Water will continue to strive for efficiency gains through bundling projects into larger programs of work for efficient delivery. Sydney Water will seek to capitalise on its experience with alliances, to develop long-term relationships with the private sector to deliver key programs of work. As explained in Sections 2.3 and 5.3.2, capital expenditure is assessed on an ongoing basis to ensure it remains prudent.

6.2.11 Key uncertainties

There are two key areas of the capital program that are less certain due to potential changes in the operating environment. These are:

- **growth related investments:** in particular the timing and scale of growth in new urban sectors and the impact of BASIX on growth in both infill and greenfield sites; and

- **overflow abatement investments:** those costs associated with expected mandatory standards to support environmental improvements associated with dry and wet weather overflows from the sewerage system.

These issues are outlined briefly below, and discussed in more detail in Appendix C.

Growth

The sequencing and timing of land releases in Sydney's southwest and northwest sectors has yet to be determined and some smaller areas are still undergoing rezoning. Based on preliminary development estimates, Sydney Water has allowed $189.5 million over the four years, with an average of $57.5 million from 2006/07 for servicing the new release areas in the southwest and northwest sectors. However, approximately 25 per cent of the proposed growth expenditure is subject to significant uncertainty. Depending on the timing and staging of releases, annual costs could vary substantially from $20 million per year to over $120 million per year.

The impact of BASIX and DEC requirements on servicing options and costs is also uncertain. It is assumed that large scale recycling schemes will be incorporated into the preferred servicing strategies for most new areas to:

- enable customers to reduce potable water consumption to meet NSW Government's BASIX criteria for a 40 per cent reduction for new homes; and
- provide wastewater systems that maintain the quality of the Hawkesbury – Nepean River to meet DEC standards for effluent discharge.

Sydney Water is investigating a range of alternative funding strategies to provide a suite of potential financing models to service growth in the southwest and northwest sectors whilst minimising the impact on Sydney Water's financial position. The funding strategies represent an additional source of uncertainty for Sydney Water.

Overflow abatement

As discussed in Section 1.3, all aspects of the overflow abatement targets under the Environment Protection Licences are yet to be finalised. Sydney Water and DEC are close to resolution on most aspects of DEC's requirements for dry weather overflow abatement and this component is not seen as a major driver of capital investment over the period. The investment required for wet weather overflow abatement has a greater level of uncertainty due to the difficulties in defining targets for the major ocean sewerage systems and the impact of these on the staging of works.

In addition, the most cost effective means of reducing overflows in the large catchments involves initial rehabilitation of Sydney Water sewers, rehabilitation of a proportion of house sewer lines and amplification and storage. Evaluation of the effectiveness of any upstream rehabilitation (both in Sydney Water's and private systems) then enables sizing of the amplification and storage infrastructure throughout the system to contain residual overflows above the required overflow objective.

This submission assumes that Sydney Water will not have to fund rehabilitation of house sewers as part of the initial works package to address wet weather overflows. Sydney Water has proposed $168 million to 2008/09 to address an appropriate program of works towards abatement of wet weather overflows. Of this, $98 million is planned for staged works on the large Malabar, North Head, Bondi and Cronulla systems focussed on rehabilitation and/or amplification and storage in the sub-systems with the highest wet weather ingress. A further $35 million is planned to address wet weather overflows at 'hot spots' or sites with high environmental or recreational value.

Depending on the outcome of discussions with DEC on appropriate staging of works within the Bondi and Illawarra systems towards longer-term objectives, capital costs within the Determination period could increase by as much as $95 million to 2008/09. Sydney Water proposes to confirm proposed expenditure on the Illawarra system with DEC by November 2004, with the result to be fed into this Determination process. The resolution of the need to rehabilitate house sewers as part of the overflow abatement works and funding of the same,

could result in operating costs of up to $50 million a year in 2007/08 and 2008/09 being incurred by Sydney Water for rehabilitation of house sewers.

This is discussed further in Appendix C.

6.3 OPERATING EXPENDITURE

This section summarises Sydney Water's operating expenditure requirements over the Determination period. It outlines the operating expenditure requirements and discusses the key uncertainties associated with the forecasts.

6.3.1 Overview

Sydney Water's regulated operating costs[35] increase from $850 million in 2004/05 to $893.2 million in 2008/09, a $43 million or 5 per cent increase in real terms (2004/05 dollars) (see Figure 11). The key driver of this increase is anticipated to be the higher cost of bulk water supplies purchased from the SCA. Sydney Water's allowance for bulk water costs reflects the SCA's requirements, which are expected to increase by $53.1 million from $124.5 million to $177.6 million in 2008/09. The price increases stem from the SCA's additional investments required to augment Sydney's water supply. Sydney Water has assumed that these charges, which are regulated by the Tribunal, will be passed through in the form of higher bulk water charges.

After allowing for these increases in SCA costs, the balance of Sydney Water's regulated costs decline from $850 million in 2004/05 to $840 million in 2008/09, a $10 million or 1.2 per cent reduction in real terms. This is a difficult goal given the 12 per cent increase in Sydney Water's asset base and a 4 per cent increase in population over the period.[36] This is equivalent to a reduction in operating cost per property of 7 per cent (or $29 per property) from 2004/05 to 2008/09. The main source of net operating cost savings are support costs, which are reduced in both the corporate areas and in direct supporting functions undertaken by the operating divisions, and maintenance costs. The reduction in costs are partially offset by operations and maintenance cost increases arising from Sydney Water's more rigorous asset management framework and increasing asset base. At the same time Sydney Water is delivering improved standards of service to its customers.

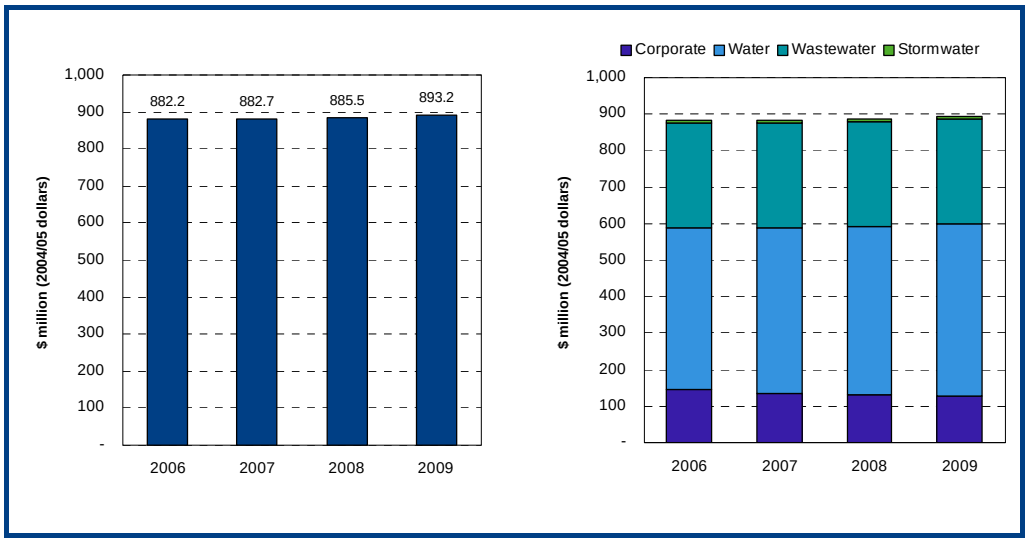

Figure 10: Sydney Water's proposed operating expenditure 2005/06 to 2008/09

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35 Sydney Water's regulated operating costs are assumed to be inclusive of all superannuation expenses and work in progress and prior year write off, but exclude the cost of non-regulated sales.

36 Total capital additions, including assets contributed free-of-charge, expressed as a proportion of 2003/04 Gross Replacement Cost of Assets.

The key sources of cost savings for Sydney Water's key activities are considered below.

6.3.2 Water

As noted above, the key driver of increasing costs for the water service is the impact of anticipated higher SCA bulk water charges. Total water costs increase from $411.3 million in 2004/05 to $472.5 million in 2008/09. Whilst the base level of SCA charges will remain steady at approximately $125 million, the additional charges will result in an increase of $53.1 million in Sydney Water's bulk water costs by 2008/09. As these costs are externally determined and cannot be managed by Sydney Water, they are excluded from the following analysis of water operating costs. The rationale for the SCA's revenue requirements, including to meet its Metropolitan Water Plan obligations, will be set out in its submission to the Tribunal for this Price Review.

Excluding the increases in SCA costs, water operating costs increase marginally over the period, from $411.3 million in 2004/05 to $419.4 million in 2008/09. Cost reductions of $30 million are delivered over the period, which are offset by increased Sydney Water operating cost requirements arising from the Metropolitan Water Plan, increased maintenance expenditure on existing assets and increased maintenance costs associated with capital expenditure on new assets. The key areas of saving are:

- support activities such as planning and commercial services which decrease by $6 million following reform of the asset management and business planning processes, together with reviews of administration, procurement and motor vehicle costs;
- reductions of $15 million by 2008/09 including:
    - assumed reduction in costs relating to specific water conservation measures (such as the residential retrofit program and rainwater tank rebate scheme); and
    - reduction of enforcement and publicity costs of current water restrictions.

Additional efficiencies are to be made in maintenance activities, with productivity improvements applied in part to delivering additional maintenance hours to meet the demands of the water networks, and the balance of the gains being recognised as cost savings ($6 million for water maintenance by 2008/09). Productivity improvement strategies for Sydney Water maintenance crews focus on developing improved workforce flexibility and scheduling arrangements, whilst negotiations with the private sector for the long-term provision of contract mechanical/electrical maintenance needs are expected to reduce these charges.

Additional savings in water treatment costs arising from reductions in potable water consumption due to the ongoing demand management program are recognised ($3 million by 2008/09). Sydney Water has delivered permanent savings in bulk water and water filtration tariffs through a range of actions including reducing financing costs and negotiating savings in chemical costs.

The savings in water operating costs are offset by additional expenditure directed toward increases in expenditure associated with:

- demand management initiatives driven by the Metropolitan Water Plan, such as $15 million per annum from 2005/06 as a contribution to the *Demand Management and Community Education Fund*, and an additional $3 million for increased active leak reduction;
- maintenance of existing assets (averaging $11 million per annum or an increase of $8 million on 2004/05). These are predominantly major periodic maintenance projects and commence in 2005/06; and
- incremental operating costs due to capital investment. This is driven almost entirely by growth ($7 million by 2008/09).

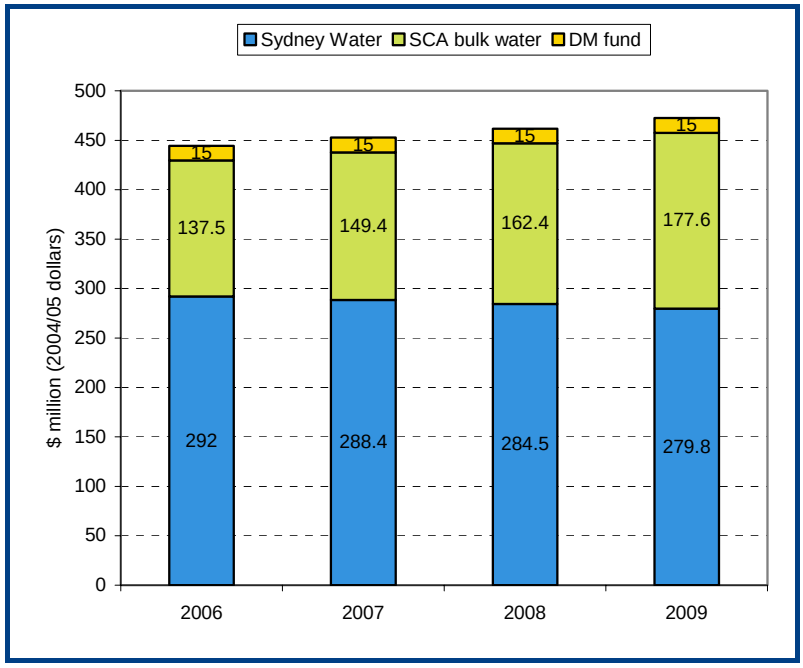

Figure 11: Sydney Water's water operating costs 2005/06 to 2008/09

Excluding SCA bulk water purchases, water operating expenditure will peak in 2005/06 at $307 million. This results from the timing of the incremental operational and maintenance needs as noted above. In conjunction with this, the benefits of reforms to support processes have not yet been fully realised by 2005/06, as benefits of phased staffing and accommodation strategies do not crystallise completely until 2008/09.

6.3.3 Wastewater

Wastewater operating costs increase marginally over the period from $275.5 million in 2004/05 to $286.5 million in 2008/09. Within this total are savings for support and customer services of $2 million by 2008/09. Productivity improvements achieved in maintenance activities are directed both toward meeting the additional demand for maintenance hours, and delivering net savings in wastewater maintenance of $6 million by 2008/09. Further savings through Asset Management of $5 million are achieved by 2008/09.

Efficiency savings of $13 million are delivered over the period. These savings are directed toward:

- operational projects that average $15 million per annum over the period. This is an increase of $7 million per annum on 2004/05. These projects are predominantly major periodic maintenance and operational projects resulting from a more rigorous and risk based approach to asset management;
- Illawarra Wastewater Strategy. Additional $5 million per annum from 2005/06 onwards for operating costs arising from completion of sewage treatment plant upgrades in the Illawarra region;
- additional costs to meet existing standards for wastewater networks. This includes SWSOOS chemical dosing and silt control (up to $8 million per annum) in order to extend the life of the sewer following a condition based assessment of its maintenance requirements; and
- additional $6 million per annum by 2008/09 for incremental operating costs arising from new wastewater infrastructure investments.

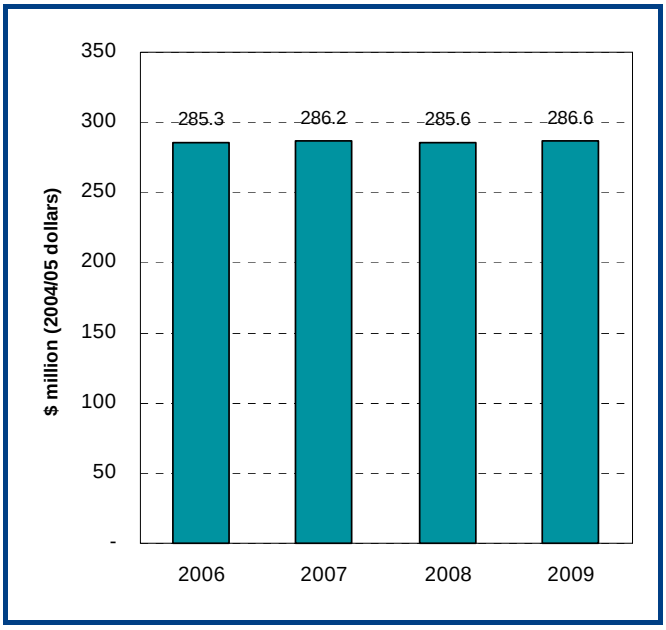

Figure 12: Sydney Water's wastewater operating costs 2005/06 to 2008/09

Wastewater operating costs peak at $286.5 million in 2008/09, arising from the cumulative operating requirements of the upgraded Illawarra treatment plants and other wastewater infrastructure investments, however, the overall increase is contained due to the implementation of the reform program for support functions.

6.3.4 Stormwater

Stormwater operating costs increase from $6.8 million in 2004/05 to $7.8 million in 2008/09. This incremental cost is required to meet the requirements of the Stormwater Environment Improvement Program (SEIP), specifically cleaning of new gross pollutant traps being installed in 2005/06, and increased disposal fees for refuse. Provision has also been made for additional costs relating to environmental management and grounds maintenance within the Rouse Hill development area.

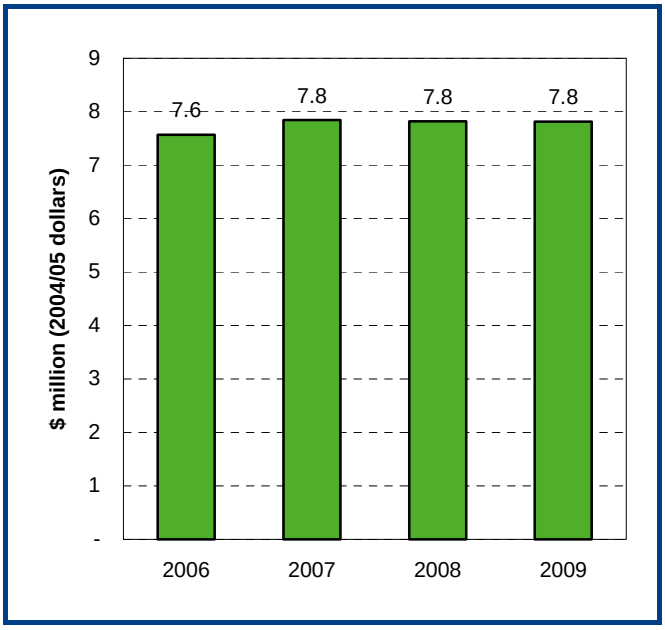

Figure 13: Sydney Water's stormwater operating costs 2005/06 to 2008/09

6.3.5 Corporate

Corporate operating costs decline from $155.9 million in 2004/05 to $126.3 million in 2008/09, a decline in real terms of 19 per cent. This is a result of targeted reform programs aimed at reducing support costs, particularly in corporate areas, as noted in Section 5.3.1. The costs of the reform itself are included as Corporate operating costs, but are transitional in nature and centred on 2004/05 (for example, redundancy provisions and workplace accommodation study together totalling $15 million).

The current reform process and subsequent initiatives will achieve the following gains by 2008/9:

- a reduction in human resources costs of $4 million following consolidation of key functions such as occupational health and safety; and training and development;
- a reduction in finance and shared services of $2 million; and
- a reduction in other corporate services costs of $4 million, including communications and marketing.

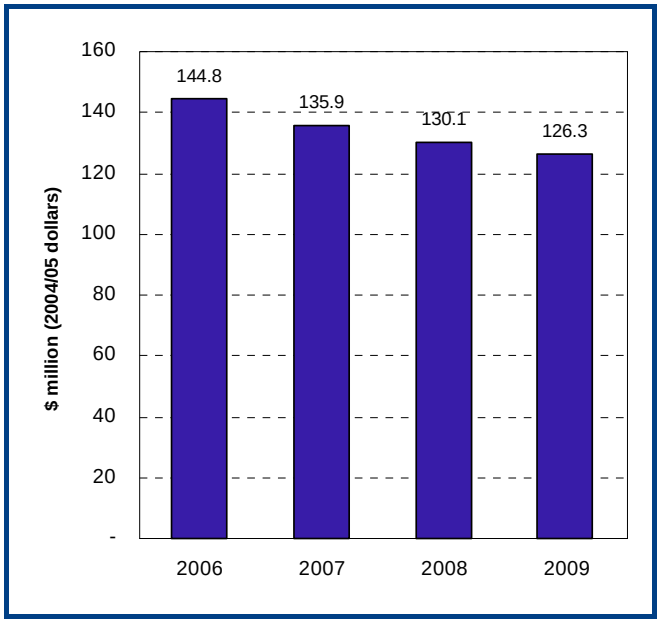

Figure 14: Sydney Water's corporate operating costs 2005/06 to 2008/09

Corporate operating costs peak at $155.9 million in 2004/05, due largely to the transitional costs of reform as noted above. The benefits of this reform program are essentially realised by 2008/09.

6.3.6 Understanding Sydney Water's cost categories and key changes

Control over operational expenditure is a relative rather than an absolute concept. Sydney Water has no control over some items, such as licence fees, but some degree of control over other items, such as electricity costs. In response to the difficulty of attributing degrees of controllability over costs, Sydney Water has adopted the following framework for allocating general ledger costs (in inclining order of controllability).[37]

[37] This analysis is based on Sydney Water's total costs.

Externally determined

This category includes items where costs are set externally or driven by external factors for the term of the Determination (subject to specific exceptions). It includes, for example, licence fees, bulk water charges, dust disease levy and (most of) water filtration tariffs, all of which Sydney Water has little control over. Nevertheless, Sydney Water attempts to minimise these costs wherever possible (see case study below). This category of costs is expected to rise from $315.5 million in 2004/05 to $358 million in 2008/09.

CASE STUDY – Build Own Operate (BOO) water filtration tariffs

Although the BOO water filtration plants are the subject of a long-term (20 year) contract and hence represent a largely fixed cost, Sydney Water has managed to secure some savings by taking the interest rate exposure on the debt facilities procured by the private consortia. Sydney Water manages the exposure through interest rate hedge mechanisms. The alternative was for Sydney Water to have fixed the interest rates for the term of the debt. However, this was not commercially sound given the high margins charged on long-term debt finance. Sydney Water has successfully negotiated to share in the benefits of refinancing and other structured financing arrangements undertaken by the consortia, which has led to lower financing costs overall. The benefits of these actions are realised through lower water filtration tariffs ($15 million in 2002/03), totalling $68 million from the commencement of the contracts to the end of 2002/03.

Fixed quantities outsourced

This category includes the costs of products or services where their quantities are largely outside Sydney Water's control and the product or service is procured externally. For example, chemicals, water restrictions advertising, computer maintenance and revenue collection are outsourced. This category of costs, which is efficiently procured and monitored in accordance with Sydney Water's BPF, is expected to rise from $200 million in 2004/05 to $232.9 million in 2008/09.

Efficient needs outsourced

This category includes the costs of products or services that are procured externally and where either:

- **trade-offs have been made to reduce costs:** for example, rent and property expenses will rise by selling CBD premises and relocating to rented premises in Parramatta, but this will be offset over time by the proceeds of property disposal and ongoing property management and maintenance savings. These changes to the property portfolio are also facilitating the delivery of savings in other areas, such as corporate overheads; or
- **volumes or costs have otherwise been reduced through negotiation:** for example, electricity and general insurance costs have been reduced through more efficient procurement and greater flexibility on the part of Sydney Water, but are expected to rise due to system expansion and rising wholesale electricity costs.

Once again, these costs are procured externally in accordance with Sydney Water's guidelines and expenditure is monitored to ensure least cost delivery. This category of costs is expected to rise from $65.7 million in 2004/05 to $81.9 million in 2008/09, primarily driven by an increase in rent (associated with the move to Parramatta) and land tax (associated with asset sales).

CASE STUDY– Electricity cost savings

The very hilly topography in Sydney Water's area of operations necessitates a high demand for energy due to pumping requirements. This demand is also expected to increase over the review period due to necessary system expansion.

Currently, Sydney Water has a very favourable electricity supply contract with Origin Energy, which expires in 2007. It is expected that the replacement contract will see electricity costs rise by nearly $4 million per annum.

To optimise efficiency in this context, Sydney Water has developed an Energy Plan and entered into an energy partnership with Energetics & Burns Roe Worley. The partnership has performance-based incentives and projects have already been put in place resulting in net savings of $3 million per annum.

Co-generation plants are operating at Malabar and Cronulla Sewage Treatment Plants, which have resulted in net savings of about $1.3 million per annum. The specialist energy partners will also be conducting the negotiations for the new energy contract, which will result in the best possible deal for Sydney Water.

Remaining (controllable) costs

The remainder of operational costs can be regarded as controllable by Sydney Water in the future, including costs of products or services that are sourced internally. This includes, for example, salary costs, long service leave, payroll tax and FBT. This category of costs is expected to fall from $269 million in 2004/05 to $215.6 million in 2008/09. This is a fall of nearly 20 per cent over the period.

Approach to cost control

Given efficient procurement practices and appropriate trade-offs by Sydney Water, the first three main categories of costs represent efficient costs (i.e. externally determined, fixed quantities outsourced and efficient needs outsourced). Only the final category (controllable costs) should be potentially subject to additional efficiency measures and as noted, these costs are expected to decline significantly over the Determination period.

Overall, the break-up of costs between these categories for the 2004/05 budget is set out in Figure 15 below. The figure demonstrates 68 per cent of operational costs are largely outside Sydney Water's control, while the remaining 32 per cent are controllable. Sydney Water is delivering cost reductions of nearly 20 per cent for these controllable costs over the Determination period.

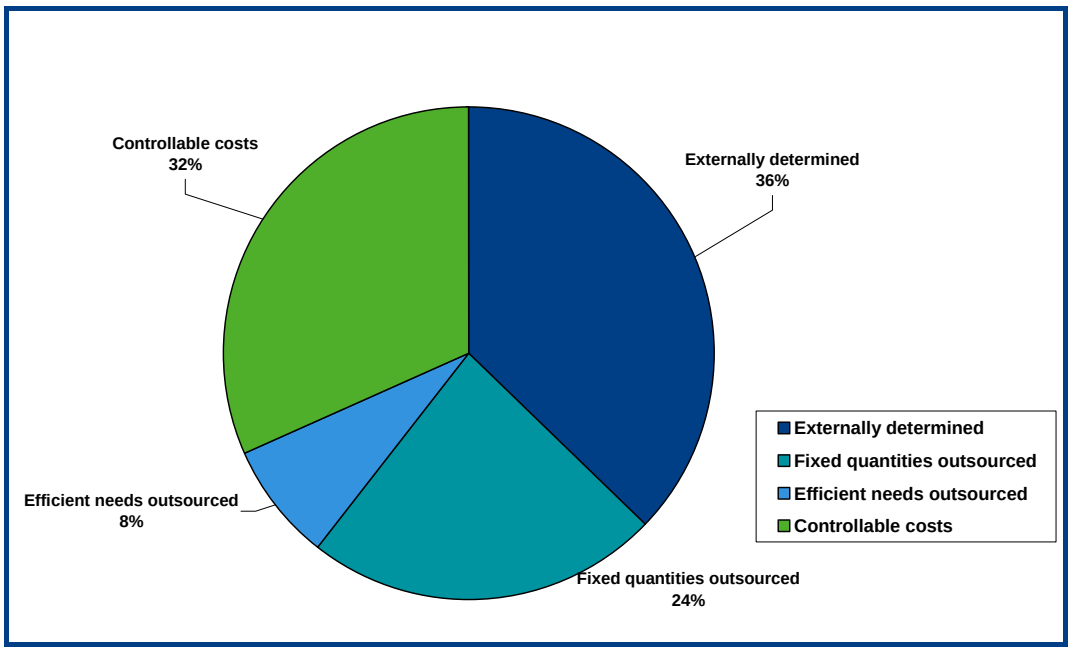

Figure 15: Split of budgeted operational expenditure 2004/05

6.3.7 Key uncertainties

There are a number of key uncertainties that have the potential to significantly adversely affect Sydney Water. These uncertainties may not only impact upon the capital program but also have a potential to affect operating costs in future years. These are:

- **growth:** changes in growth have the potential to mostly impact capital expenditure. To the extent that growth-related capital investments are brought forward they will bring forward Sydney Water's operational and maintenance costs associated with those assets. This increase is not expected to be significant within the scope of total operations;
- **demand/supply:** the Metropolitan Water Plan has significantly reduced the uncertainty in relation to initiatives required to manage the supply/demand balance. The operating and capital costs presented in this submission include the additional costs for investigating desalination as a supply option and have allowed for $15 million per annum for contributions to the *Demand Management and Community Education Fund* to commence from 2005/06; and
- **overflow abatement:** especially in relation to wet weather overflows have the most potential to increase operational costs beyond those included in this submission. Should Sydney Water be required to rehabilitate private house service lines as part of the least cost package of works to meet sewer overflow objectives then up to $50 million per annum in additional operational costs would be incurred from 2007/08.

6.4 RATE OF RETURN

The rate of return that Sydney Water earns on its regulated asset base is a key determinant of Sydney Water's revenue requirement and resulting prices. Sydney Water notes that it is the Tribunal's role to determine an appropriate rate of return for Sydney Water's regulated business. This section briefly outlines the key issues in relation to Sydney Water's rate of return and the price implications of the Tribunal's determination of an appropriate return over the next four years.

Sydney Water's believes that its prices should allow it to recover revenues for its recurrent costs and the costs of the Metropolitan Water Plan with the Tribunal to determine an appropriate rate of return that reflects the true cost of this investment.

6.4.1 Background

Since the regulated asset base was revalued in 1999/00 to be $5.4 billion and assuming a pre-tax real discount rate of 7 per cent, Sydney Water has consistently earned significantly low returns. In the previous Determination the Tribunal calculated a range for the WACC of 5.2 to 6.7 per cent. The mid-point of this range is 5.95 per cent. The allowed revenues in the last regulatory period were assumed to deliver a rate of return of 5.9 per cent in 2003/04 and 5.6 per cent in 2004/05 – consistently below the mid-point of the Tribunal's range. In practice, Sydney Water's return is lower than the Tribunal targets as a result of higher than expected costs and lower than expected demand.

The Tribunal's issues paper does not specifically discuss the calculation of the appropriate WACC range for metropolitan water agencies. Rather, it refers to its recent *Electricity Distribution Pricing Determination* for information on the Tribunal's preferred approach for calculating the rate of return on capital. In June 2004, the Tribunal determined a WACC range of 6.1 to 7.5 per cent with a mid point of 6.7 per cent and a real pre-tax WACC of 7 per cent for the NSW electricity distributors. [38] This is significantly above the equivalent rates of return on the regulatory asset base of around 5.6% previously allowed for Sydney Water.

Sydney Water does not believe there should be a material difference in the underlying WACC provided for electricity and water infrastructure assets. This view is supported in recent decisions by the Independent Competition and Regulatory Commission, which applied a

[38] Independent Pricing and Regulatory Tribunal, *NSW Electricity Distribution Pricing – Final Report,* June2004 p57.

common WACC (7.0 per cent real pre-tax) to both ACTEW and AGL's electricity and water businesses. Sydney Water has modelled the price impacts of a medium point in this range (6.5 per cent), though it notes that the mid-point is 0.5 per cent lower than the 7.0 per cent real pre-tax WACC recently set by the Tribunal for the NSW electricity network operators.

6.4.2 The rate of return

It is important that Sydney Water earns an appropriate rate of return on its regulated asset base to encourage:

- **responsible use of water**: this will only occur if consumers face the true cost of providing water and wastewater services, including an appropriate rate of return on the community's investment in Sydney Water; and
- **future investment in water and sewer improvements**: Sydney Water should be appropriately compensated for making investments in the community's infrastructure in order to give it incentive to undertake these investments. Any reduction in investment is not sustainable, and in the longer term would lead to degradation of Sydney Water's asset base and declining levels of reliability and service.

Sydney Water emphasises the importance of ensuring a reasonable rate of return is delivered at a clearly defined date to secure future investment in the community's infrastructure.

As discussed in the next section options should be explored to recognise any revenue shortfalls resulting from the transitional arrangements.

6.5 REVENUE REQUIREMENT

The fundamental objective of pricing is to generate a revenue stream that ensures Sydney Water remains commercially viable and continues to meet its service requirements.

The NSW Government has committed to implementing the Strategic Water Reform Framework endorsed by COAG in 1999. This framework requires the implementation of prices that reflect full cost recovery, including an appropriate rate of return. Cost reflective pricing is required to ensure efficient allocation of society's scarce resources. The COAG framework is consistent with the principles of *The Independent Pricing and Regulatory Tribunal Act*, which requires the Tribunal to have regard to the financial viability of agencies in regulating prices.

In this context, this section presents Sydney Water's revenue requirements based on the expenditures outlined above and allowing for a reasonable rate of return. It outlines the methodology and assumptions used to estimate Sydney Water's revenue requirement, before presenting future revenues.

6.5.1 Methodology

Sydney Water has determined its aggregate revenue requirement using the building block approach advocated by the Tribunal.[39] This sets Sydney Water's revenue to cover the following key cost components:

- capital expenditure;
- efficient operating, maintenance and administration expenditures;
- consumption of capital (depreciation allowance);
- return on capital; and
- working capital.

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[39] The Tribunal, *Appendix 4 Building Block Methodology and Incentive Regulation using CPI6X* in 'Sydney Water Corporataion – Prices of water supply, wastewater and stormwater services from 1 July 2003 to 30 June 2005', Determination 4 May 2003.

6.5.2 Assumptions

Sydney Water used the following key assumptions surrounding the building cost components used in deriving Sydney Water's revenue requirement.

Capital expenditure

The capital expenditure requirements set out in Section 6.1 have been used to calculate the revenue requirements, with adjustments made for cash contributions from developers and borrowing costs.

Operating expenditure

Sydney Water has included the operating expenditure presented in Section 6.3 to estimate its revenue requirement.

SCA costs represent a pass-through to Sydney Water, and the Tribunal will determine appropriate bulk water prices for SCA as part of the Price Review. Sydney Water has liaised with SCA to ensure that Sydney Water's assumed payments to the SCA reflect its required operating costs and return over the period, plus the additional costs associated with implementing the recommendations of the Metropolitan Water Plan. Should the Tribunal's Determination on SCA prices be different to this assumption, Sydney Water's operating costs, revenue and prices will need to be adjusted accordingly to ensure pass-through of SCA charges.

Asset values

Revenue requirements relating to both the consumption of capital (depreciation) and cost of capital depend upon the value assigned to Sydney Water's assets. Sydney Water has adopted the RAB value established by the Tribunal in the previous Determination. In line with the Tribunal's approach Sydney Water has 'rolled forward' this RAB to incorporate new capital expenditure, depreciation, assets disposals and inflation since 2003. For the next price path period Sydney Water continues to roll forward the RAB with appropriate adjustments for proposed net capital expenditure, depreciation and asset sales.

Depreciation

Sydney Water has calculated depreciation taking the Tribunal's straight-line approach and assumed average asset lives.

Return on capital

As discussed above, Sydney Water has assumed a 6.5 per cent rate of return for the purposes of demonstrating the price impacts of its core service revenue requirements. The price impacts would vary if the Tribunal adopted a different rate of return.

Working capital

Working capital is the capital required to compensate for timing difference between revenue (cash inflow) and expenses (cash outflow) over the operating cycle of the business. The inclusion of working capital as part of the total regulatory asset base on which a rate of return is earned recognises the capital committed to receivables and other normal business activities at one point in time. The value of commercial capital should earn the same regulated return as capital invested in the system assets, as it is an intrinsic aspect of running a business.

Sydney Water has used assumptions consistent with the Tribunal in estimating the working capital contribution to its revenue requirement.

6.5.3 Revenue requirement

Table 15 below shows the roll forward of Sydney Water's RAB over the regulatory period. The RAB increases from an opening RAB of $8 billion in 2005/06 to a closing RAB $10 billion in 2008/09 based on the capital expenditure requirements outlined above.

Table 15: Roll forward of RAB 2005/06 to 2008/09

($million of 2004/05)	2005/06	2006/07	2007/08	2008/09
Opening RAB	8,253	8,735	9,127	9,664
plus net capital expenditure[1]	618	651	604	490
less disposals	(20)	(46)	(27)	(1)
less depreciation	(116)	(123)	(129)	(134)
Closing RAB	8,735	9,217	9,664	10,020

Note:

1. Net capital contributions minus developer contributions

Application of the building blocks as outlined above generates the following revenue requirements for Sydney Water over the next four years. This represents an increase of 12 per cent over the Tribunal's allowed revenue for 2004/05 or 16 per cent over Sydney Water's expected revenue for 2004/05.

Table 16: Projected aggregate annual revenue requirement 2005/06 to 2008/09

Expenditure ($million of 2004/05)	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Operating expenditure	$882	$883	$886	$893
Depreciation/ return of capital	$116	$123	$129	$134
Return on capital	$552	$583	$613	$639
Revenue requirement	**$1,550**	**$1,589**	**$1,628**	**$1,667**

6.5.4 Revenue sensitivities

To achieve the core service revenue presented above would require a material increase in prices for customers. Table 17 illustrates the across the board increases in all water, wastewater and stormwater prices required to deliver the notional revenue requirements presented above.

Table 17: Real price increases due to full cost recovery 2005/06 to 2008/09

Year	2005/06	2006/07	2007/08	2008/09
Expected real price increases	13.9%	0.1%	2.5%	2.1%

Sydney Water acknowledges that a 13.9 per cent real increase in bills for all customers in 2005/06 is significant.

In order to moderate initial customer impact while still ensuring customers receive strong water conservation signals during the current drought, the Tribunal could set a 7 per cent real increase in 2005/06 followed by relatively smaller annual real increases of 3.8 per cent over the period of the Determination. This would ensure prices are fully cost reflective and provide a mid-range rate of return of 6.5% by 2008/09, the last year of the price path period. This approach would mean that Sydney Water would not recover its full revenue entitlement in 2005/06, 2006/07 and 2007/08, which equates to $140 million (in NPV terms) less in revenue

than if fully cost reflective prices (including the assumed 6.5 per cent rate of return) were introduced from 2005/06 onwards.

The combination of Sydney Water's core service requirements plus a 6.5 per cent rate of return by 2008/09 would result in a real price increase of 20 per cent over the Determination period. This increase is driven by:

- the efficient capital and operating expenditure required to meet service standards, including maintaining and renewing existing assets and developing new assets to meet growth. These requirements account for around 55 per cent of the price increase;
- the requirements under the Metropolitan Water Plan, including inter-basin transfers and desalination studies, which account for around 15 per cent of the price increase; and
- delivering a 6.5 per cent rate of return on the community's investment in Sydney Water by the end of the period, which accounts for around 30 per cent of the price increase.

Financial and customer impacts in this submission are presented for the 7 per cent/3.8 per cent increase scenario, which achieves a 6.5 per cent rate of return by 2008/09 and an under-recovery of $140 million (in NPV terms). Section 7.3 sets out the customer impacts of Sydney Water's prices based on this scenario with Appendix I providing more detail on the customer impacts of a price path based on a 6 per cent and a 7.5 per cent rate of return by 2008/09.

6.5.5 Financial impacts

Based on the price path modelled by Sydney Water, debt to equity (revalued) increases over the term of this Determination to 39 per cent as Sydney Water's debt levels increase by $1.2 billion to $3.8 billion in 2008/09. However, during this period funds flow interest cover is also expected to increase to 3.0. This is considered a sustainable benchmark level for Sydney Water. All other indicators also improve to financially prudent sustainable levels.

Whilst returns of 6.5% over the period of this Determination are modest in comparison to benchmarks and represent the mid-point of the range set by the Tribunal for the NSW electricity distributors, they nevertheless represent an improved and sustainable position for Sydney Water, given their historical context.

7 Setting prices

Having illustrated Sydney Water's revenue requirements around a mid-point rate of return outcome, this section considers the calculation of prices over the price path period under this scenario. Section 7.1 presents Sydney Water's consumption forecasts. Section 0 discusses the appropriate price structure. Customer impacts are considered in Section 7.3, and tools to manage customer impacts are discussed in Section 7.4.

7.1 CONSUMPTION

Demand assumptions are a key input to both the determination of revenue – through the relationship between demand and operating and capital expenditure – and the setting of prices. Sydney Water uses an end use model to generate forecasts of future demand and to evaluate water conservation measures. In the short term forecasting demand is a difficult exercise, given the uncertainty about the duration of current water restrictions.

This section presents Sydney Water's demand forecasts over the price path period. We briefly discuss the relevant background, outline our methodology and assumptions, present our forecasts and discuss the key uncertainties around those forecasts.

7.1.1 Background

Demand and supply balance

The current Price Review takes place at a time of increasing community awareness of the issues associated with water scarcity. The response to the ongoing drought conditions and the depletion of water storage levels has seen the introduction of voluntary restrictions on 15 November 2002, followed by Level 1 mandatory water restrictions on 1 October 2003 and Level 2 on 14 June 2004. These restrictions have had a major influence in curtailing water demand. In 2003/04, water consumption fell to 563 GL, a reduction of 11 per cent from 2002/03.

Water demand in Sydney Water's area of operations has remained relatively stable over the last 20 years even though the population has increased by over 750,000 in the same period. The restraint on overall water demand has been achieved through a combination of structural changes in housing and industry, pricing restructure, improved appliance efficiency, demand management programs and periods of water restrictions. Notwithstanding a significant commitment of resources to demand management and a significant reduction of per capita water use during the 1990s, in recent years customer demand has been greater than the SCA's current estimate of supply yield of 600 GL/annum.

There are ongoing demands for water supply into the future to meet the needs of existing customers and approximately an additional 40,000 people every year and provide additional water for environmental flows.

Demand management strategy

Sydney Water is currently required by its Operating Licence to reduce the per capita quantity of water drawn from all sources (excluding recycled water) by 28 per cent over the period from June 1991 to June 2005 and by 35 per cent to June 2011.[40] In order to meet these ambitious targets Sydney Water has introduced the largest demand management program delivered by an Australian utility and one of the largest internationally, with a diverse range of programs targeting all sectors of the market and many different end uses of water.

Figure 16 shows observed and climate corrected demand trends since 1991, on a 12 month rolling average basis. The figure shows that there have been significant reductions in per

[40] This represents a reduction from 506 litres per capita per day (lcd) in 1991 to 364 lcd in 2005 and 329 lcd by 2011. Based on current population estimates, these per capita targets convert to volumetric targets of 562 GL per year by June 2005 and 538 GL per year by June 2011.

capita use over the time period. While a small part of these reductions can be attributed to the fact that the reference year (1990/01) was hot and dry, real reductions in per capita use have been achieved as a result of pricing restructure, periods of water restrictions, falling industrial water use and unaccounted for water, and Sydney Water's demand management programs. The green line estimates where climate corrected per capita demand would have been without Sydney Water's demand management programs.

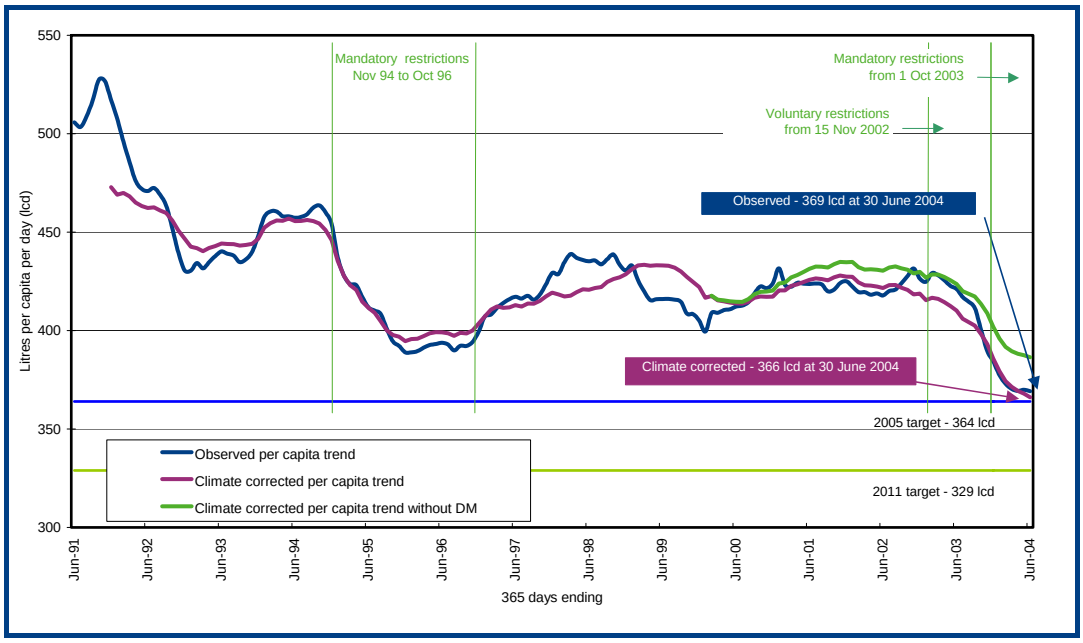

Figure 16: Observed and climate corrected per capita demand 1990/91 to 2003/04

The water savings generated by the demand management programs are estimated to have reduced per capita demand by 20 litres per capita per day (lcd) since 1999. Current estimates of demand on a climate corrected basis show that without the impact of water restrictions, demand would be approximately 405 lcd (Figure 16). The reductions in per capita water use to date have had a positive impact on the total demand, with no increase over the period 1990/91 to 2003/04 in spite of a 15 per cent increase in population.

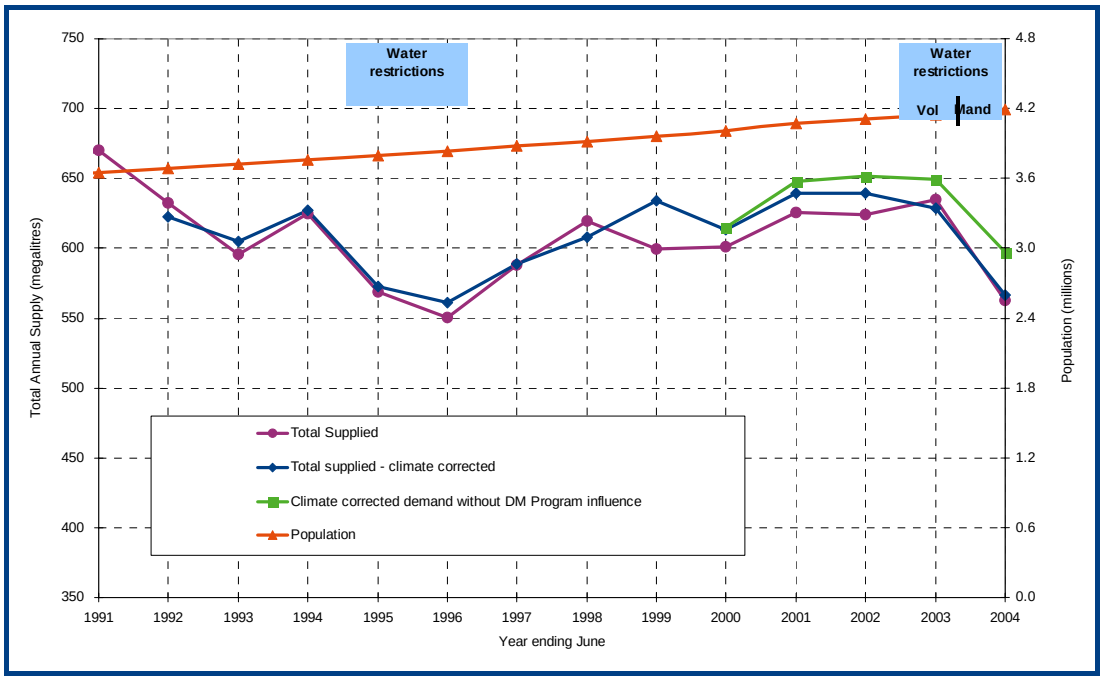

Figure 17: Total water demand 1990/91 to 2003/04

Assuming restrictions were to be lifted in January 2005 and average weather, demand is likely to be within a few gigalitres of the Operating Licence target in 2005. Notwithstanding the temporary impact of water restrictions, under normal operating conditions, per capita demand will have been reduced by an estimated 74 per cent of the Operating Licence target objective by 2005. The inclusion of per capita demand reduction targets in Sydney Water's Operating Licence has in effect meant that Sydney Water has been responsible for managing the impacts of factors outside its control including:

- an increase in population of 540,000 in Sydney from 1991 to 2004, the fastest rate of population growth being in the years since the commencement of the demand management program;
- highly variable weather conditions over the last five years, including record low rainfall; and
- high economic growth, significant changes in Sydney's housing mix resulting in a higher proportion of multi-unit dwellings and lower persons per dwelling and replacement of its industrial base with commercial, high-technology businesses.

The shortfall against the 2004/05 conservation target also reflects the:

- longer lead times for the implementation of regulatory programs, particularly appliance performance standards and price restructure; and
- variation between forecast and actual water savings from some programs. At the time of the initial planning of the demand management program, there was no data on which to base estimates of participation rates and water savings for different conservation measures. Hence estimates were based on the best available information about trends in water use and customer participation rates. Information subsequently gathered by Sydney Water shows that water savings from some initiatives were lower than initially expected. This improved understanding of water savings is reflected in Sydney Water's estimates of future savings from various programs.

In addition to ongoing drought-related community education campaigns, an expanded range of demand management programs have been delivered over the last few years. Additional resources have been allocated to accelerate water savings from the leakage reduction and business sector programs and to establish new residential sector programs. Key programs in the current demand management strategy include:

Setting prices

- residential indoor retrofit programs for both private and public housing;
- residential outdoor education and incentive program;
- residential rebate programs for rainwater tanks and water efficient washing machines;
- business sector water efficiency programs for industrial, commercial and government customers;
- leakage reduction programs, including leak detection and repair and pressure reduction; and
- recycled water programs, including for example BlueScope Steel industrial and Rouse Hill residential recycling.

Sydney Water has also been actively involved in progressing further regulatory reform, including water pricing, development controls for housing (BASIX), appliance efficiency standards and labelling and outdoor water use conditions. These programs form part of the least cost actions proposed in the Metropolitan Water Plan to ensure integrated demand and supply options for managing Sydney's water supply over the next 25 years.

CASE STUDY – Residential water efficiency

The residential sector currently accounts for more than 70 per cent of metered customer water use. In a typical year, household water use in showers, toilets and taps accounts for 32 per cent of total water drawn from all sources, or about 198,000 ML/annum.

Program description

The targeted Residential Retrofit Program is a continuation of the *Every Drop Counts Residential Retrofit Program* that commenced in January 2000. The program offers householders the opportunity to have a qualified plumber visit their home to provide a water efficiency 'tune-up'. The service includes the installation of a new AAA-rated showerhead and tap flow regulators, a toilet cistern flush arrestor and the repair of minor leaks. The service has a retail value of up to $148 and is provided for just $22, with an additional charge of $38.50 for any additional showerheads (after the first is installed). The service is offered free of charge to low-income households holding a Pensioner Concession Card, a Centrelink Health Care Card or a Veterans' Affairs Gold Card. Since the inception of the program approximately 236,800 retrofits have been completed (to the end of July 2004).

Implementation during 2003/04

During 2003/04, most areas across Sydney were offered the program for a second time and some suburbs were given a third round offer. Throughout the year, an additional 28,892 households received the service.

Program effectiveness

Reviews of the program show an average reduction in water use of over 20,000 litres per annum per participating household. This equals an 8 per cent reduction in average water use per household or 12 per cent of average indoor water use.

Retrofits remain one of the most cost-effective and easy ways of achieving sustained reductions in residential indoor water use.

7.1.2 Demand forecasting methodology

Sydney Water uses an end use model to forecast demand and evaluate the impact of different demand or supply side options on future overall demand. The model disaggregates water demand into the major end use components. A forecast is developed for each demand component based on estimates of what will happen in the market to influence the specific end use. For example, changes in the level of adoption of water efficient appliances, housing types, household occupancy and consumer behaviour are taken into account. Data on these demand drivers are sourced from industry reports, surveys, sales data, independent research and Sydney Water's own research.

A baseline forecast is established to represent a 'do nothing' situation. As described below, an agreed 'across government' baseline has been used to provide a standard basis for assessment of selected initiatives in Sydney Water's demand management program. Each initiative is modelled systematically in turn, to develop a forecast that represents the cumulative effect of demand management initiatives.

7.1.3 Assumptions

The following key assumptions were used to generate the demand forecasts using the end-use model.

Baseline forecast

A constant per capita baseline forecast of 426 lcd is assumed in the model.

The baseline demand forecast represents the trend in expected average annual demand without intervention from demand management programs. In September 2003, Government agencies agreed on a baseline forecast for the Metropolitan Water Plan – applying average water usage of 426 lcd to current DIPNR projections of population growth. This usage figure of 426 lcd is based on analysis of climate adjusted demand trends between periods of water restrictions (November 1996 to October 2002). The analysed demand data was adjusted to remove the impacts of Sydney Water's demand management program from 1999 to 2002.

Given the current uncertainty regarding future per capita demand beyond the current restrictions, Sydney Water believes that a projection of 426 lcd represents a reasonable baseline forecast for the Determination period.

Growth

The end-use model utilises information on population, housing stock and property turnover to generate estimates of future customer numbers and water sales. The constant per capita baseline assumption of 426 lcd is projected forward to reflect population growth, based on the current population and housing stock growth forecasts supplied by DIPNR. Sydney Water adjusts the DIPNR forecasts for the Greater Sydney Statistical Division to align with its area of operations.

Operating conditions

The demand forecast represents expected water demand under average climate conditions. This presumes average operating conditions with respect to rainfall and temperatures which is used as at starting point for forecasting demand.

Demand management programs

The major Sydney Water demand management programs to be delivered over the next four years include the continuation of existing programs such as residential and public housing retrofits, rainwater tank rebates, the *Every Drop Counts Business Program*, school education and rainwater tank rebates, the BlueScope Steel recycling scheme, expansion of Rouse Hill recycled water scheme and Sydney Water's substantial leakage reduction program.

New programs under investigation or development include the outdoor landscape assessment program targeting residential high water users, sensible outdoor water use conditions, pressure management program, multi unit metering, recycling plants at North Head and Malabar Sewage Treatment Plants, and a recycled water supply to new homes in the Hoxton Park development area.

Table 18 and Table 19 show the forecast water savings from the planned Sydney Water demand management programs and the estimated level of program investment.

Table 18: Forecast water savings (ML/annum) 2003/04 to 2008/09

Program	03/04	04/05	05/06	06/07	07/08	08/09
Residential						
EDC targeted retrofits	4,889	5,515	6,454	7,183	7,663	8,017
Public housing retrofits	0	261	324	428	523	523
Rainwater tank rebates	162	309	456	603	750	897
Landscape assessment		0	129	952	1,746	2,514
Outdoor education and permanent controls	2,765	2,814	7,672	7,791	7,882	7,972
Washing machine rebates[2]	118	118	118	118	118	118
Multi-unit billing and metering	0	0	2,441	2,429	2,408	2,378
Business						
Business program	4,315	5,835	7,355	8,875	10,395	11,915
EDC in schools	45	90	135	180	225	225
School rainwater tank rebates	0	21	21	21	21	21
DM fund	0	0	750	3,750	6,750	9,750
Leakage reduction						
Active leak detection	15,148	17,469	18,820	20,828	23,293	26,736
Pressure management[3]	0	0	365	2,008	4,563	7,118
Recycled water						
BlueScope Wollongong	0	2,000	7,300	7,300	7,300	7,300
Rouse Hill Stage 2	1,337	1,497	1,658	1,658	1,658	1,658
Rouse Hill Stage 3	0	0	0	24	84	180
Hoxton Park Greenfield	0	0	132	273	404	566
North Head STP	0	0	694	694	694	694
Malabar STP	0	0	0	166	1,329	1,329
STP reuse and minor recycling	626	626	686	686	686	686
Regulatory measures						
Pricing/tariff restructuring	0	0	16,538	17,177	17,983	18,296
Appliance labelling and standards	0	0	140	282	430	3,791
BASIX[3]	0	958	3,313	5,891	7,985	10,073
Total	29,405	39,024	78,373	89,944	102,625	116,878

Notes:

1. Includes $1.13 million for program management.

2. Based on international experience, it is estimated that approximately 50% of pressure reduction savings will be generated through reduced customer demand and water losses.

3. The total takes into account the overlapping contribution of new residential water recycling schemes to the assumed 40 per cent water use reduction in new dwellings through BASIX.

Table 19: Forecast Sydney Water program investment ($'000/annum) 2003/04 to 2008/09

Program expenditure ($'000 2004/05 dollars)	**03/04**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
Residential						
EDC targeted retrofits	4,133	2,826	6,385	5,115	3,315	2,415
Public housing retrofits		1,615	45	45		
Rainwater tank rebates	1,386	3,400	1,500	1,500	1,500	1,500
Washing machine rebates	796					
Landscape assessment	181	450	583	1,665	1,689	1,713
Outdoor education and permanent controls	818	678	778	578	578	578
Multi-unit billing and metering			1,967	900	900	900
Business						
Business program	1,994	2,178	2,121	2,121	2,121	2,121
EDC in schools	148	208	308	308	308	
School rainwater tank rebates		250				
DM fund pilot		2,500				
DM fund			15,110	15,110	15,110	15,110
Leakage reduction						
Active leak detection	2,482	2,500	5,500	5,500	5,500	5,500
Pressure management		1,000	4,500	7,000	7,000	7,000
Recycled water						
BlueScope Wollongong	12,985	4,115				
Rouse Hill Stage 2						
Rouse Hill Stage 3			7,000			7,000
Hoxton Park greenfield			10,000	30,000	7,000	
North Head STP		3,000	500			
Malabar STP				3,000	4,000	2,000
STP and minor recycling	240	1,720				
Regulatory measures						
Pricing/tariff restructuring		1,250	1,100	1,100	1,100	1,100
Appliance labelling and standards						
BASIX						
Total Operating expenditure	13,308	17,855	20,286	19,503	16,967	16,451
DM fund			15,110	15,110	15,110	15,110
Total Capital expenditure	12,985	9,835	22,000	40,000	18,000	16,000

7.1.4 Demand forecasts

Impacts of demand management programs

Given the high degree of uncertainty about the duration of water restrictions, the forecasts below are based on *baseline* rather than *current* consumption under restrictions. The recovery of consumption from current restriction levels is discussed in more detail in the next section. As described in this section, opportunities to expand Sydney Water's existing demand management programs have been assessed and included in the current forward program where feasible and cost effective. Programs are selected on the basis of maximising water savings at least cost, the carryover of existing program commitments, and keeping a well balanced portfolio of programs across customer sectors.

Taking into account the expected water savings from Sydney Water and expected government commitments, plus the 29 GL annual savings achieved through Sydney Water's demand management programs to 30 June 2004, the expected savings against the baseline by 2008/09 are estimated to be 117 GL each year.

Figure 18 shows the impacts of these demand management programs. This reflects Sydney Water's demand management forecast set as part of the Metropolitan Water Plan and its relationship to the current operating licence target.[41]

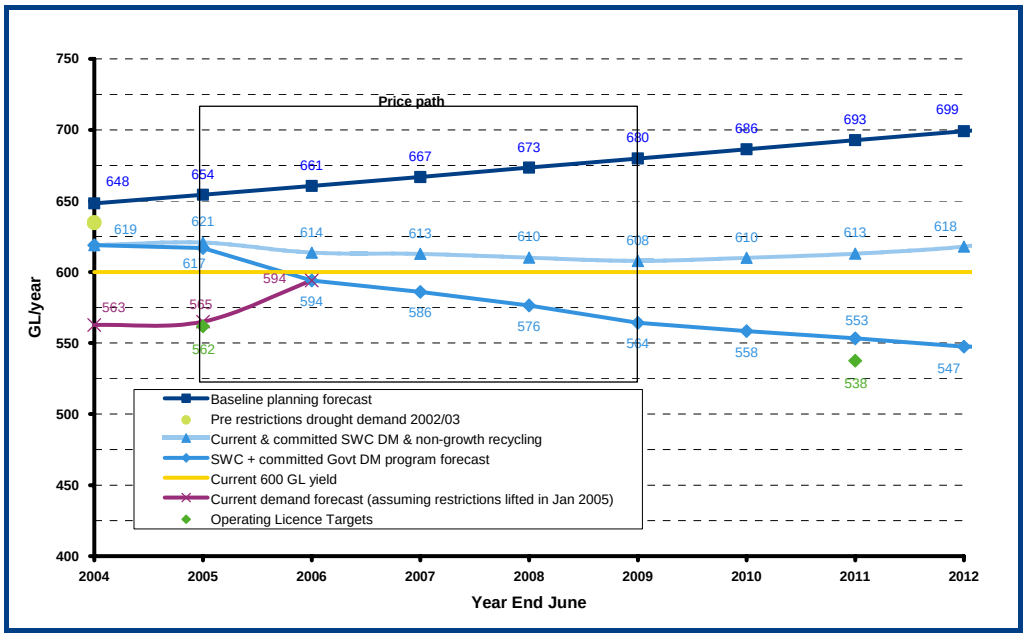

Figure 18: Forecast volumetric demand 2003/04 to 2011/12

Recovery of consumption from current levels

Consumption in 2004/05 is projected to be around 565 GL, assuming restrictions are lifted by January 2005. However, there is considerable uncertainty around this estimate as it is wholly dependent on average rainfall and inflow conditions being realised and a consequential increase in dam levels. If Level 2 restrictions continue for the remainder of 2004/05 and target reduction levels are achieved, demand would be expected to be about 530 ML. If Level 3 restrictions are put in place, demand could be even lower. Once again, actual demand outcomes depend on weather patterns and the lifting of water restrictions.

Beyond 2004/05, assuming mandatory restrictions are lifted, demand is expected to rise and stabilise to levels consistent with the demand management program forecast from 2005/06.

7.1.5 Key uncertainties

There are a number of uncertainties associated with the forecast of demand, including:

- the uncertainty around the forecast based on baseline assumptions; and
- the potential for variation from assumed demand management program outcomes, including the Metropolitan Water Plan initiatives.

Baseline forecast assumptions

The forecast is sensitive to baseline assumptions, as discussed below:

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41 The Operating Licence target requires Sydney Water to reduce water demand by 35 per cent by 2010/11 against its baseline set in 1990/91.

- **post restrictions impact on baseline demand:** following the 1994 to 1996 water restrictions, demand did not return to pre-restriction levels. Demand increased once restrictions were lifted and stabilised in 1998 at a peak level more than 20 lcd lower than prior to restrictions. This is considered to be due to heightened community awareness of the need to conserve water and a corresponding change in underlying water usage behaviour.[42] A lower post restriction baseline could either lower the forecast or delay the need for some planned demand side programs over the near term; and
- **climate variation:** the forecast assumes average climate conditions. Annual variability in demand due to weather factors has been analysed using a simple combined seasonal decomposition and regression model that relates monthly averages of historical per capita demand (measured in lcd) to temperature, rainfall and evaporation. The model estimates that in 95 per cent of years, annual baseline demand could vary upwards from the average by up to 5.4 per cent and downwards by up to 3.8 per cent due to climate variability in normal operating conditions (without restrictions). This equates to a range of demand variability of 36 GL upwards and to 25 GL downwards from year to year.

Demand management program outcomes

Another key area of uncertainty consists of the water use reduction outcomes from Sydney Water's demand management programs. Critical issues for the demand forecast are the water saving assumptions for individual demand and alternative supply options and the potential interaction between selected options.

Water saving assumptions

Where possible, assumptions for the estimation of water savings are based on measured consumption outcomes from existing programs to date. Water saving assumptions about residential retrofits, the business efficiency program and leakage reduction are based on quantified experience over the last few years. Sydney Water measures the outcomes of these programs and updates forward planning assumptions as new information comes to hand. Recycled water options that substitute potable water use can rely on existing consumption data to confidently estimate future water savings, for example BlueScope and Rouse Hill.

Where measured data or research information is not available, reasonable assumptions are made. The most uncertain options are those with limited referenced experience. Some of the regulatory and consumer behaviour change options fall into this category. Examples include price restructuring, outdoor education and permanent restrictions. Regulatory options influencing technology adoption such as minimum appliance performance standards, rating and labelling, and BASIX have higher confidence levels because assumptions are based on current demographic and research data about market penetration, usage levels and appliance performance specifications.

Option interaction

There is potential for realised savings to be less than estimated because some options may be competing for water savings from the same market sector or customer group. Sydney Water's prime approach to minimise this issue is to model options (and sub-options) to target discrete customer segments, so as to avoid overlap. Where this is not possible, and there is a risk of possible interaction between selected options, water saving assumptions are reduced accordingly.

The potential interaction between price restructuring and all other options is a particularly challenging issue. To minimise this issue, all selected options were included to develop a demand forecast. Pricing and tariff customer response assumptions (using the Tribunal's elasticity estimates)[43] were then applied to this reduced forecast to determine water savings from the price restructuring option.

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42 Sydney Water, *Community views on water conservation and restrictions*, July 1995.

43 The Tribunal, *Investigation into price structures to reduce demand for water in the Sydney Basin, Final Report*, July 2004.

Potential outcome variability

Figure 19 shows the forecasts with all options in the current scenario having either optimistic or pessimistic outcomes. The probability of all options under or over-achieving at the same time is minimal, so this chart shows the extremes of potential outcomes, that is a best and worst case scenario.

In the analysis below, assumptions about the variability of water saving outcomes vary from program to program. Existing programs backed by historical evaluation data may assume an outcome variance as low as 5 per cent, whereas new untested programs may apply an uncertainty factor of up to 50 per cent. The analysis suggests demand could vary by as much as +2.3 per cent and –4.8 per cent around Sydney Water's base case forecast by 2009.

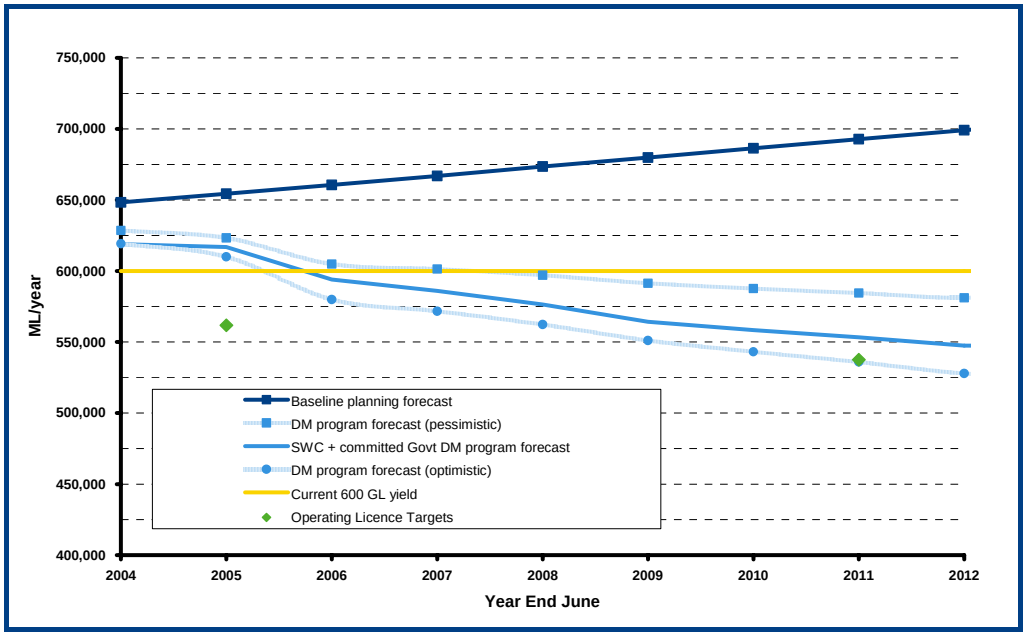

Figure 19: Demand forecasts – optimistic and pessimistic outcomes 2003/04 to 2013/14

7.2 WATER PRICE STRUCTURE

This section outlines Sydney Water's preferred approach to setting water prices. It begins with an overview of the key considerations in setting prices, including the underpinning principles. It then summarises Sydney Water's preferred position on water prices and pricing structure in the context of the Price Review.

7.2.1 Background

The Metropolitan Water Plan sets out a plan for managing the supply/demand balance using a range of demand and supply side tools. Demand management strategies are vital to containing the growing demand for water. A range of Sydney Water and Government strategies to reduce the quantum of water used are in place. Of these, a key demand management strategy is water pricing. The Metropolitan Water Plan supports tariff restructuring to ensure customers face strong water conservation signals. Appropriate pricing can:

- send a strong signal to conserve water;
- send a signal to reduce discretionary water usage in the residential sector (eg. outdoor use);
- be an incentive for buying water efficient appliances;
- be an incentive for industry and business to invest in water efficient appliances; and

- be an incentive for switching to other forms of water (eg. recycled water).

Sydney Water agrees with the Tribunal that a restructure of water pricing is necessary to ensure customers face appropriate water conservation signals.

7.2.2 Sydney Water's approach to price restructuring

The central element of Sydney Water's position on price restructure is an emphasis on the key role of pricing in achieving a sustainable demand/supply balance for Sydney. The current tight supply/demand balance and the drought serve to highlight the importance of getting the price of water right in Sydney. Sydney Water first highlighted these issues in its submission to the Tribunal for its price structure review.[44]

In addition to the regulatory principles outlined above, Sydney Water has identified a series of factors that need to be taken into account in determining the preferred pricing structure. These include:

- the need to introduce sustainable and dynamic demand reduction measures;
- the desire to reduce the complexity of tariffs to improve price signals; and
- the importance of acknowledging customer preferences in achieving a balance between price and non-price conservation measures.

An important consideration in the assessment of water pricing options is the impact on customers. Although Sydney Water believes that any issue of hardship and inability to pay should be primarily addressed through targeted concessions and payment assistance schemes, the various tariff proposals may have significantly differing implications for different customers. This is therefore an important consideration in assessing the relative merits of pricing options. Weighing up these considerations is a key role for the Tribunal in the selection of the preferred tariff option.

7.2.3 The Tribunal Final Report on price structures in the Sydney Basin

The Tribunal's Final Report examined five alternative options for changing the structure of retail prices and concluded that an inclining block tariff provided the best compromise between sending customers a strong signal about the need to reduce water consumption and mitigating the adverse impacts on some customers.[45] The key features of the option recommended by the Tribunal are:

- retail prices charged by Sydney Water to end-users would be restructured from the current fixed access charge combined with a flat volumetric charge, to a smaller access charge combined with an inclining block tariff;
- the inclining block tariff would be based on a tier 1 price up to a threshold of 100 kilolitres (kL) per quarter and a higher tier 2 price for consumption above that threshold; and
- the tier 1 price should be set in reference to the long-run marginal cost (LRMC) of water and the tier 2 should be some mark-up (say 50 or 100 per cent) of the tier 1 price.

We discuss the key features of the Tribunal's recommendations below.

7.2.4 Measuring the opportunity cost of water

Promoting efficiency – the importance of opportunity cost

A starting point for a discussion of pricing principles is the observation that efficiency is generally promoted by a volumetric water price that equals the opportunity cost of supplying an additional unit of water. Opportunity cost refers to the value of the best alternative foregone when making a choice. In practical terms, opportunity cost is the marginal cost of

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[44] Sydney Water, *Sydney Water's submission for the investigation into price structures to reduce demand for water in the Sydney Basin*, 27 February 2004.

[45] The Tribunal, *Investigation into price structure to reduce the demand for water in the Sydney Basin, Final Report*, July 2004.

supplying another unit (kL or GL) of water. Setting the volumetric price of water equal to the marginal environmental and financial cost of providing water ensures that:

- consumers only consume water where the marginal benefit exceeds the marginal cost; and
- producers supply water up to the point where the additional revenue received covers the marginal cost.

Much of the debate in water pricing surrounds the concepts of LRMC and short-run marginal cost (SRMC). While SRMC considers the opportunity cost of, say, the next kL or GL of supply, LRMC normally considers the opportunity cost of much larger increments of additional supply (or reduced demand).

The concept of LRMC is perhaps most relevant when there is significant spare capacity (such that prices based on SRMC will not signal the costs of water use in the future) and policy makers are not willing to allow prices to rise dramatically when supply is scarce. Where LRMC may be below SRMC (as is likely in current circumstances in the Sydney Basin where supply is scarce), LRMC pricing may understate present opportunity costs and lead to inefficient over-consumption or under-production of potable water. However, SRMC will tend to be more volatile, increasing dramatically as the demand approaches full capacity but then falling sharply when new capacity is introduced.

Sydney Water notes that the Tribunal has argued that the retail price of water should be based on the LRMC – where LRMC is calculated by dividing the costs of balancing the supply and demand for water in the Sydney Area by the additional amount of water that is purchased or saved through demand management measures.

Estimating long-run marginal cost

It is frequently the case that the approach to the estimation of LRMC is not so much focussed on the cost of the next minor *increment* of supply as the forward-looking *average* cost of supply. For example, if existing water sources are at capacity and another source must be built to accommodate rising demand, the LRMC would be the cost of the new source divided by the quantity of water that the new source will supply. This is really just the expected average cost of supply from the new dam. There are a number of accepted methods for calculating LRMC:

- the average incremental cost approach considers the least-cost solution(s) required to address supply/demand imbalances over a suitable long-term period, say 25 years, and divides that cost by the forecast increase in demand;
- the alternative ‘perturbation’ approach developed by Turvey involves calculating the incremental cost of meeting a small permanent change to the demand forecast; and
- the Hanke Turvey deferral method considers the cost of deferring lumpy capital expenditures required to meet demand growth by one period.

In practice, accurately estimating LRMC is a difficult task. Nevertheless, it is possible to calculate a reasonable range for LRMC by setting out the demand and supply options to be followed. The Metropolitan Water Plan provides a enhanced basis for the estimation of LRMC in the Sydney Basin though there is more work to be done. Sydney Water looks forward to assisting the Tribunal in its analysis of LRMC where possible, to ensure that the LRMC has regard to:

- environmental costs of source augmentation;
- SCA and Sydney Water’s operating environment, including all applicable laws, taxes and subsidies;
- the least cost mix of options to meet the increment to demand, including Sydney Water’s demand management program;
- an appropriate time period for analysis; and
- the downstream costs, including *incremental* treatment, transportation and retailing costs.

Sydney Water's preliminary estimates suggest the LRMC is likely to be above current variable charges, by a margin in the order of 40 per cent. For example, Sydney Water proposes to increase the water usage price from approximately $1 to $1.40 by 2008/09 as a reflection of the scarcity of current water prices.

7.2.5 Retail price structure

Increased usage charges

Sydney Water recommends that water prices should be restructured to improve water use efficiency and to reduce water demand. Higher volumetric retail prices are necessary to balance demand with available supply. This could be achieved through either a higher, single-rate volumetric tariff or an inclining block tariff. A (single) volumetric price would ensure all consumers face the same pricing signal, and all consumers are encouraged to participate in water conservation. On the other hand, an inclining block tariff may better meet equity objectives than a single-rate volumetric tariff. This is because the inclining block tariff structure sends a strong conservation signal to consumers who use a large amount of water, where much of this consumption may be regarded as discretionary (eg. watering gardens, filling and maintaining swimming pools).

Sydney Water recognises that the trade-off between providing appropriate price signals and managing equity considerations is not straight-forward. On issues of both equity and efficiency it is appropriate for the Tribunal to be the final arbiter.

Setting the level of prices

Sydney Water supports setting usage prices with respect to opportunity cost. However, given the current supply/demand imbalance, estimates of LRMC may understate the present opportunity cost of water in the Sydney Basin. For these reasons Sydney Water believes that there is a strong case for increasing usage prices to ensure that prices reflect the true scarcity value of water. In the case of the inclining block tariff Sydney Water believes there is a strong case for setting tier 1 prices above current usage prices, particularly in the period before measures intended to restore the supply/demand balance have taken effect.

Implementation issues

In its submission to the Tribunal's investigation into price structures to reduce water demand in Sydney, Sydney Water recommended that if supported by Government, an inclining block tariff should be applied on a quarterly basis to metered households only.[46] As the Tribunal noted in its final report for its price investigation, the implication of this is that a household would be entitled to 100 kilolitres of water per quarter at the standard water usage price. This means that a household using in excess of 100 kilolitres in any one quarter would pay the higher water usage price for some consumption even if their annual water usage was less than 400 kilolitres.[47]

The Tribunal accepted Sydney Water's recommendation that if introduced the inclining block tariff should apply on a quarterly basis, noting the following advantages and disadvantages of this approach:

- The benefit of a quarterly as opposed to an annual step price is that it sends a more frequent price signal to high-volume consumers about the cost of water use, allowing them to respond by reducing consumption. If an annual step quantity was applied, some customers could receive three quarterly bills with usage charged at the base water usage price but have unknowingly reached the annual step quantity. If so, their final quarterly bill for the year will be much higher because the tier 2 charge will apply to the water use in that quarter. A quarterly step point avoids this problem.

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46 Sydney Water, *Sydney Water's submission for the investigation into price structures to reduce demand for water in the Sydney Basin*, 27 February 2004.

47 The Tribunal, *Investigation into price structures to reduce the demand for water in the Sydney Basin, Final Report*, July 2004, p.19.

- The quarterly step approach is also easier to apply to the current billing cycle and will help discourage extra discretionary water use during summer, because customers cannot avoid the tier 2 price in one quarter just because they tend to use less water for discretionary purposes at other times of the year.
- The major disadvantage of this approach is that some customers may pay for a portion of their water usage at the tier 2 price even though their annual consumption is less than the equivalent annual step quantity.[48]

7.2.6 Impact on Sydney Water

Sydney Water's revenues would become more uncertain with an increase in usage charges. This is because an increasing proportion of Sydney Water's revenue will be determined by the volume of water sold. The actual volume of water sold will in turn depend on the level of water prices, the location of the price step, and the reaction of consumers to the new prices.

Although revenue volatility is a serious concern for Sydney Water, Sydney Water considers that these risks can be successfully mitigated through regulatory mechanisms (as discussed in Section 3.3).

In its analysis of alternative price restructure options presented later in this section Sydney Water has assumed:

- cost reflectivity across services between activities (ie. no cross subsidisation of one service by another), taking into account Sydney Water's costs over the Determination period (including efficient operating and capital costs and a reasonable rate of return); and
- a real reduction in fixed water charges of 20 per cent over the four year determination period, with an increase in usage charges to compensate for this reduction to provide the additional revenue required for water service delivery. As discussed in Section 7.2.9 this results in usage charges of around $1.40/kL by the end of the Determination period.

It may be possible to increase usage charges further, by reducing fixed charges to prevent excess revenue arising. Sydney Water notes that the Tribunal adopted this approach in its Final Report, albeit in the context of an assumption of revenue neutrality. Taking into account Sydney Water's revenue requirements as previously specified in this submission, the Tribunal could increase the water usage price to around $1.60/kL by the end of the Determination period, as a consequence the fixed charge would need to be reduced to $0.

Alternatively, the Tribunal could decide to increase the water usage price above Sydney Water's revenue requirements by introducing an integrated water-sewer price where the increase in the water usage price, for example, above $1.60, would be offset by lowering wastewater charges. The benefit of an integrated water-sewer price structure is that it would send a much stronger water conservation signal to customers via the water usage charge. However, it also results in greater customer impacts, particularly for high water using residential customers, including the large, low-income families but also for water only customers, businesses with low discharge factors and businesses that are currently not subject to Sydney Water's sewer usage charge.

Sydney Water encourages the Tribunal to have regard to these linkages in its consideration of regulated prices for Sydney Water's services.

7.2.7 Wholesale price

As with retail prices, wholesale prices should in principle reflect the opportunity cost of supply. The question is whether higher volumetric wholesale prices (or a wholesale step price) are necessary to encourage parties to reduce water demand.

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[48] The Tribunal, *Investigation into price structures to reduce the demand for water in the Sydney Basin, Final Report*, July 2004, p.19.

The Tribunal Final Report rejected the wholesale step price proposal. The Tribunal cautioned that wholesale price changes could distort the market for demand management and supply mitigation in a way that conflicts with broader conservation strategies.

The Tribunal considered that the appropriate next step to take in relation to wholesale prices is to review the balance between the fixed and variable prices, with a view to better signalling the SCA's LRMC in usage charges.

Sydney Water views SCA's costs as a pass-through, and is concerned to ensure that any adjustments to the wholesale price are appropriately taken into account in setting the regulated price caps for Sydney Water's services.

7.2.8 Recommendations

Sydney Water supports retail tariff restructure for the Sydney Basin. Setting retail prices at levels that reflect opportunity cost is the best way to ensure that water will be supplied and consumed in efficient ways and quantities. In this context, Sydney Water recommends the following broad pricing approach:

- volumetric retail water price increases. This would occur through a greater usage charge component which can also be supplemented by introducing an inclining block tariff;
- Sydney Water's endorsement of tariff restructuring to increase usage charges is on the basis that effective mechanisms be put in place to mitigate the increased business risk implied by a greater emphasis on volumetric charges, as outlined in Section 3.3;
- Sydney Water agrees with the Tribunal that if an inclining block tariff regime is adopted, it should be applied on a quarterly basis and restricted to metered households. For the purposes of this submission a metered household means an individually metered house;[49] and
- subject to the proviso that Sydney Water's revenues are sufficient to meet its efficient capital and operating expenditure requirements (including an appropriate return on the community's investment), Sydney Water endorses reductions in the level of fixed charges to customers. Particular care needs to be taken in reducing fixed charges to a point that introduces cross-subsidies between activities.

7.2.9 Price paths

The discussion of Sydney Water's revenue requirements in Section 6.5 was predicated on the retention of the current pricing structure, and merely increasing all prices uniformly to achieve the desired revenue outcome. There is however, a need to send stronger demand management signals to water users in order to reduce water consumption. This necessitates reforms to current pricing structures with consequential shifts in the revenue burden from some customers to others.

The proportion of water charges recovered through usage based charges has increased considerably over time to ensure customers face the appropriate price signals about the cost of the water they use. In 1993, the weighted average price for water usage was $0.58 per

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[49] This does not apply to:

- Properties used for primary production, farms, market gardens, nurseries or orchards;
- Multi-unit properties that either share a common meter or are individually metered such as flats, units or dual occupancies;
- Non-residential properties;
- Mixed development properties;
- Properties that are exempt from service charges; and
- Properties that share a joint service.

kilolitre in real terms, compared to around $1 per kilolitre today.[50] Over that time customers have adjusted their consumption patterns in response to the changing structure of water prices. The proposed changes represent a further step to ensure that customers can respond to the true value of Sydney's scarce water resources.

Sydney Water has modelled the impacts of three alternative price scenarios, to test the effects of the various options on representative customer groups. In each case Sydney Water has estimated the prices required to deliver revenue outcomes in line with the 7 per cent/3.8 per cent transitional arrangement illustrated in Section 6.5 above. The options modelled are:

- **no restructure:** a uniform increase in current fixed and variable tariffs. Under this option the water usage charge increases to $1.21/kL by 2008/09; and
- **two tariff restructure options**: these tariff restructures involve an inclining block tariff and an increased usage charge component. As discussed, in each case there is a real reduction in fixed water charges of 20 per cent over the four year determination period, with an increase in usage charges to compensate for this reduction to provide the additional revenue required for water service delivery. Sydney Water has also sought to ensure that revenues from each service are commensurate with costs. Large price increases in stormwater charges are required to achieve this aim, given the removal of property based charges. This is discussed in more detail below. The restructure options considered are:
    - **Option 1: stepped price structure:** reflects the Tribunal's proposed price structure for metered households. The option involves a water usage charge for all customers (residential and non residential) rising to $1.38/kL by the end of the Determination period (2008/09), with a second tier water usage charge of a $1.80/kL introduced at the start of the Determination period for metered house customers consuming more than 100 kL/quarter. [51]
    - **Option 2: a larger usage component:** this option maintains Sydney Water's current two part tariff structure, with a relatively constant service charge and a proportionally larger usage charge. Under this option the water usage charge increases to $1.40/kL by 2008/09.

Table 20 to Table 22 below present the prices for the various options.

[50] This is a weighted average price for all water used, in real 2004/05 dollars, based on the stepped tariff arrangement applicable at the time (i.e. 21c/kL 0-219kL/yr, 30c/kL 219-300kL/yr, 59c/kL 300-10,950kL/yr, 64.3c/kL above 10,950kL/yr in 1993/94 dollars).

[51] For the purposes of illustrating customer impacts Sydney Water has used annual consumption of 400kL/annum as a proxy for estimating those customers consuming in excess of 100kL/quarter.

Table 20: No restructure option prices 2005/06 to 2008/09

2004/05 dollars	2005/06	2006/07	2007/08	2008/09
Access charges (per year)				
Water	$83.05	$86.18	$89.43	$92.81
Wastewater	$370.93	$384.91	$399.42	$414.48
Stormwater (Residential)	$26.80	$27.81	$28.86	$29.95
Stormwater (Non-residential)	$75.59	$78.44	$81.40	$84.47
Usage charge (per kL)				
Water	$1.084	$1.125	$1.167	$1.211
Water >100 kL/quarter	N/A	N/A	N/A	N/A
Wastewater	$1.226	$1.272	$1.320	$1.370

Table 21: Stepped tariff structure prices 2005/06 to 2008/09

2004/05 dollars	2005/06	2006/07	2007/08	2008/09
Access charges (per year)				
Water	$72.00	$68.00	$66.00	$62.00
Wastewater	$368.00	$376.00	$384.00	$393.60
Stormwater (Residential)	$32.00	$36.00	$40.00	$44.00
Stormwater (Non-residential)	$80.00	$92.00	$104.00	$112.00
Usage charge (per kL)				
Water	$1.085	$1.185	$1.270	$1.375
Water >100 kL/quarter	$1.800	$1.800	$1.800	$1.800
Wastewater	$1.150	$1.150	$1.150	$1.150

Table 22: Larger usage component prices 2005/06 to 2008/09

2004/05 dollars	2005/06	2006/07	2007/08	2008/09
Access charges (per year)				
Water	$72.00	$68.00	$66.00	$62.00
Wastewater	$368.00	$376.00	$384.00	$393.60
Stormwater (Residential)	$32.00	$36.00	$40.00	$44.00
Stormwater (Non-residential)	$80.00	$92.00	$104.00	$112.00
Usage charge (per kL)				
Water	$1.140	$1.220	$1.300	$1.400
Water >100 kL/quarter	N/A	N/A	N/A	N/A
Wastewater	$1.150	$1.150	$1.150	$1.150

The following section considers the impact of each of these tariff options for Sydney Water's customer base.

Customer responses

From a demand management perspective, and based on the price elasticity assumptions adopted by the Tribunal in its Final Report, prices associated with a "no price structure reform" option could reduce total annual water demand by between 12 GL and 15 GL (around 2 per cent) by 2008/09.

Both the "stepped tariff" and "increased usage" options could result in reductions in total annual demand of between 14 GL and 28 GL (2 per cent to 4 per cent) by 2008/09, with reductions under the "stepped tariff" being perhaps 1 GL or 2 GL higher than the "increased usage" option. However, estimating price elasticity response depends on a range of potentially valid assumptions, not the least being whether consumers respond to the marginal or average change in price. This is reflected by the ranges in the above estimates and they should be regarded as indicative rather than precise.

Stormwater prices

The Tribunal has indicated that its intention is to not review the appropriate level and mechanisms for funding stormwater costs until the current government reviews have been resolved. Sydney Water remains committed to providing stormwater services that meet statutory obligations. Sydney Water is also committed to the implementation of catchment based solutions to stormwater improvement.

Sydney Water welcomes the removal of property based charging for stormwater services as of 1 July 2004, and notes that this is in accordance with the COAG principles. However, it should be noted that as a consequence Sydney Water's stormwater revenue base has been reduced from $19 million in 2000/01 to a forecast of $13.7 million in 2004/05, whilst its cost base has remained static. The declining revenue base is a key challenge for Sydney Water which needs to be addressed in this Price Review.

Notwithstanding the potential for further institutional changes in the control of stormwater assets, Sydney Water faces considerable financial expenditures to meet its ongoing statutory obligations within its designated area of operations. This expenditure cannot be recovered from the current stormwater charges.

Sydney Water considers that the price increases are necessary to meet the requirements of:

- the aging stormwater infrastructure base, which requires consistent ongoing renewal expenditure into the foreseeable future;
- the ongoing SEIP capital expenditure program, which will require investment over the price path period and generate extra operating expenditure requirements; and
- imposition of additional costs for specific assets, including the Botany Wetlands and the Alexandra Canal over the next four years.

In order to recover costs, it is proposed that, over the determination period, residential stormwater charges will increase from the current $25.05 per year in 2004/05 to $44 per year and non-residential stormwater charge will increase from $70.65 in 2004/05 to $112 per year. This will achieve fully cost reflective stormwater prices by 2008/09.

The customer impacts of this proposed price change are discussed in the next section.

7.3 CUSTOMER IMPACTS

7.3.1 Customer profile and usage

To understand the likely effects of pricing reform it is important to understand the nature of customers served by Sydney Water. This section briefly describes the customer base and their historic patterns of water usage.

Sydney Water offers water, wastewater and stormwater services, with some customers benefiting from all three. Table 23 shows the number of customers receiving these services.

Table 23: Number of customers by service (September 2004)

Service	Number of customers	Per cent of total customers
Water and wastewater	1,161,000	70
Water, wastewater and stormwater	450,000	27
Water only	50,600	3

Figure 20 shows the types of customers that use water distributed by Sydney Water.

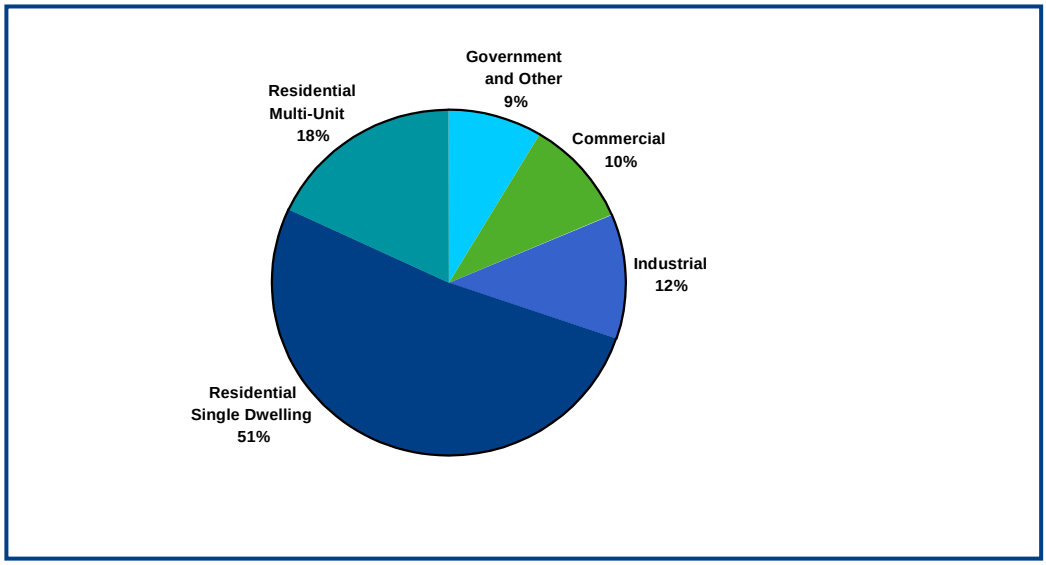

Figure 20: Breakdown of water usage by sector (2003/04)

Source: Sydney Water Corporation Water Conservation & Recycling Implementation Report 2003/04

Because of the metropolitan nature of the Sydney Basin, the majority of water supplied by Sydney Water is used by residential customers (69 per cent). People living in metered houses use 51 per cent of the total amount of water supplied by Sydney Water. Those who live in flats and units use only 18 per cent of the water and are much less likely to use water for outdoors purposes (ie. gardens, pools, etc). Non-residential customers form a minority of users and use 31 per cent of total water distributed.

Residential water consumption varies depending on the size of households. The average household of one to five people uses less than 400 kL of water per annum. The table below shows average water consumption by size of household.

Table 24: Average water consumption by household size

Number of occupants	Average consumption (kL/annum)
1	142
2	228
3	267
4	305
5	370
6	408

Source: Residential Water Use in Sydney, the Blue Mountains and Illawarra – Results from the 2003 Tribunal Household Survey

Figure 21 shows that in 2002/03 14.5 per cent of households used over 400 kL/annum.

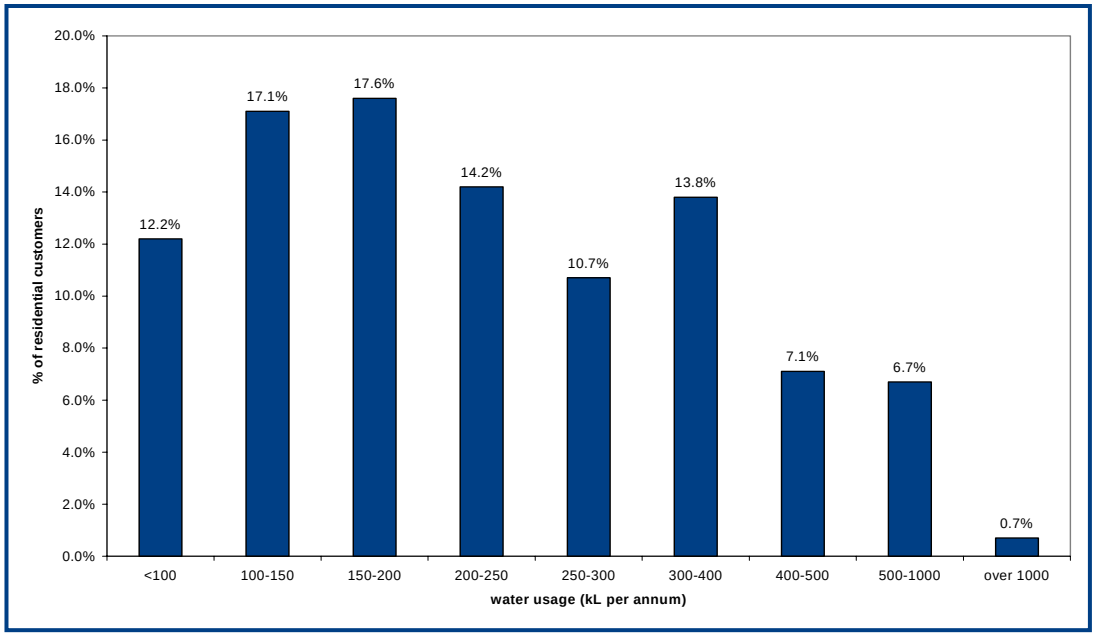

Figure 21: Distribution of residential water usage – Sydney Water Corporation (2002/03)

Water consumption by residential customers falls into two categories:

- Non-discretionary use: water required for clothes washing, cooking, cleaning, toilet flushing and bathing; and
- discretionary use: optional indoor and outdoor use for gardens, etc.

Figure 22 shows more detail of how residential customers typically use water.

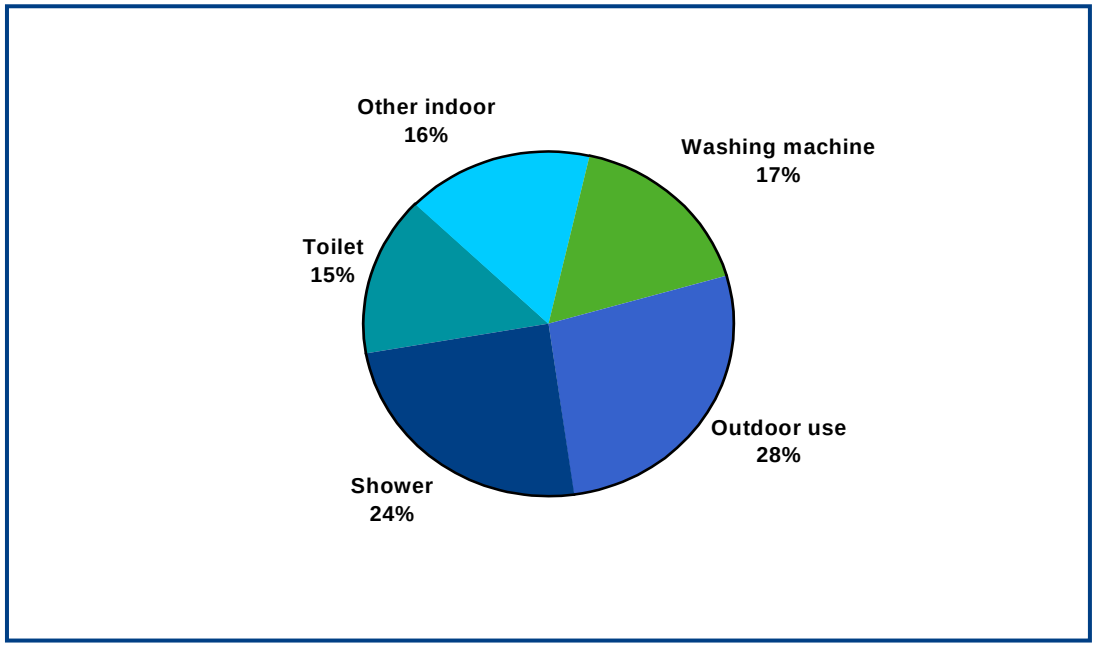

Figure 22: Breakdown of residential water usage

Source: Adapted from Sydney Water Operating Licence Reports to Licence Regulator, 1 September 2003

In developing its pricing options, Sydney Water has taken into consideration the profile and usage of all its customers. Price structures targeted at saving water through reducing discretionary use are favoured. Extensive customer research has shown that customers are concerned about sustainability of water supply and are generally in favour of usage based pricing.[52]

7.3.2 Customer impacts of no restructure

Even assuming no change to the pricing structure, prices will need to rise to meet increasing costs resulting from growing demands on scarce water resources, environmentally acceptable wastewater management, aging infrastructure and urban growth.

As discussed in Section 6.5, average real price increases of 7 per cent in 2005/06 followed by 3.8 per cent each year over the next three years are needed to deliver revenue fully reflective of Sydney Water's projected requirements by 2008/09.

Applying these increases uniformly to all prices would mean that all customers would face a total bill increase of just under 20 per cent in real terms over the four year regulatory period. For a household using 100 kL of water per year, this represents an average total water and wastewater bill increase of $26 ($0.49 per week) each year, while for a household using 500 kL per year, the average annual increase would be around $45 ($0.87 per week).

As discussed in Section 6, these scenarios assume that Sydney Water achieves a real pre-tax WACC of 6.5 per cent by 2008/09. The outcomes would vary if a different WACC were to be adopted by the Tribunal.

To help manage the water supply/demand balance, some price structure change is necessary to encourage consumers to use services more efficiently and to ensure that one service is not being cross-subsidised by another.

7.3.3 Customer impacts of pricing proposals

Price structure change means that there will not be a uniform increase in all prices, and the impact on customers will vary depending on both the services they use and the extent to which they use them.

These reforms involve differing levels of price increase for each service (ie. water, wastewater and stormwater) based on their relative increases in costs and a stronger emphasis on water usage prices as a means of influencing demand.

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[52] Sydney Water, Customer Research Findings – Price Reform & Water Conservation, the Tribunal Quarterly Meeting, 3rd May 2004.

Sydney Water and SCA, *Community views on sustainable water resources.*

Key findings included:

- There was generally a high level of support within the community for the notion that water needs to be conserved
- Fear of running out of water and caring for the environment are the most important motivating factor for people to save water

Sydney Water and SCA, *Pricing for Demand Management.*

Key findings included:

- The most acceptable billing structures, in decreasing order of preference were:
  - A purely volumetric charge for water and a step tariff after a fixed volume of water was consumed
  - Adding a step tariff after a fixed volume of water was consumed without altering access charges
  - Purely volumetric charge for water and sewer
  - Seasonal pricing (higher volumetric charge in summer)
  - Purely volumetric charge for water only
  - Step tariff structure comparing winter and summer consumption
- Most respondents indicated that they would reduce water consumption for each of the pricing structures presented.

Sydney Water, *Values survey of high water users.*

- The majority of the high users supported the principles of user pays pricing and believe that "people who use a lot of water should have to pay a higher price for their water than everyone else"

As discussed in Section 7.2.9 Sydney Water's proposal for cost reflective water pricing is embodied in two alternative pricing structure options:

- **Option 1: Stepped price structure:** reflects the Tribunal's proposed price structure for metered households. The option involves a water usage charge for all customers (residential and non-residential) rising to $1.38/kL by the end of the Determination period (2008/09), with a second tier water usage charge of a $1.80/kL introduced at the start of the Determination period for metered house customers consuming more than 100 kL/quarter. [53]
- **Option 2: A larger usage component:** maintains Sydney Water's current two part tariff structure, but holds the access charge constant and generates all additional water revenue through an increase in the usage price, that is $1.40.

Meanwhile for wastewater and stormwater services pricing proposals have been confined to a single option – retention of the existing price structures, with an increase in the fixed access charge for each service, reflective of service costs.

The following impact analysis explores the changes in customers' total water and sewerage bill assuming no restructure, a stepped price and a larger usage component. This analysis is based on Sydney Water's revenue requirement recovering a real pre-tax WACC of 6.5 per cent by 2008/09. Appendix I summarises the price impacts of a revenue outcome based on a 6 and 7.5 real pre-tax WACC as discussed in Section 6.

7.3.4 Water and wastewater customer impacts

Residential customer impacts

Option 1: Metered house customer impacts of a stepped price

In terms of their total water and wastewater bill, all metered house customers using less than 75 kL/quarter (300 kL/annum) would experience a lower bill increase under the stepped price structure option than if no structure change were introduced.

Only the 14.5 per cent of metered households that consume above 400 kL/annum would experience the tier 2 usage price proposed under this option. The greater impact faced by these higher users aligns with the objective to target reduction in discretionary water consumption.

The 2005/06 and 2008/09 impacts on metered house customers are illustrated in Figure 23 below with the dotted line representing the stepped structure impact and the smooth lines showing the impact under no structure change.

[53] For the purposes of illustrating customer impacts Sydney Water has used annual consumption of 400 kL/annum as a proxy for estimating those customers consuming in excess of 100 kL/quarter.

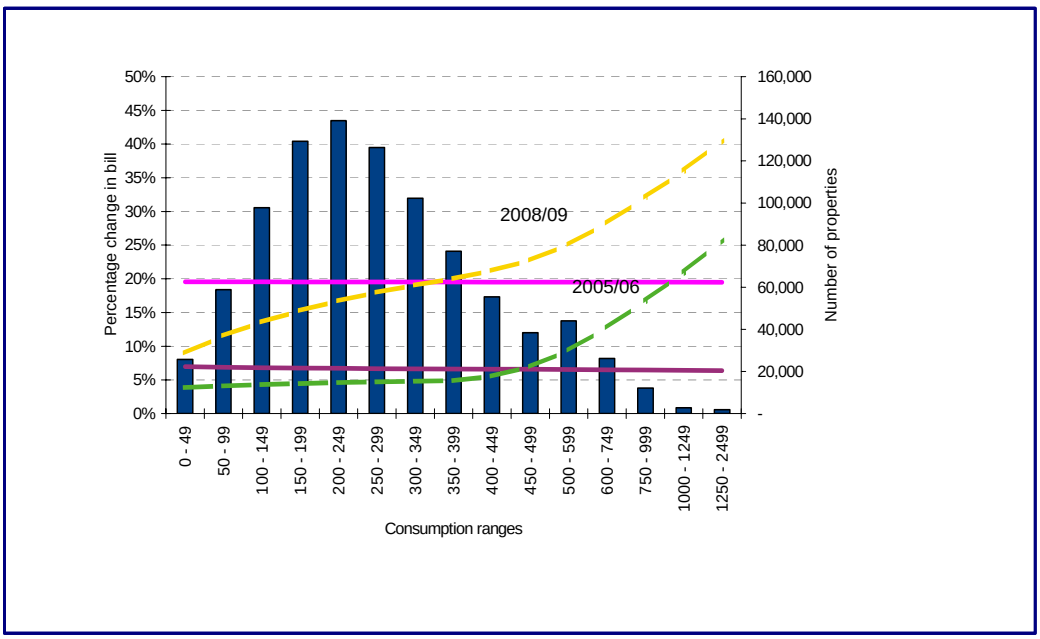

Figure 23: 2005/06 to 2008/09 annual real water and sewer bill impact for metered house customers (stepped price compared to no structural change)

Option 2: Metered house customer impacts of a larger usage component

In terms of their total water and wastewater bill, under the larger water usage component option, metered house customers using less than 275 kL per annum would experience a lower cumulative bill increase, than without price structure change. This impact on metered house customers for 2005/06 and 2008/09 is illustrated in Figure 24 by the dotted lines (Option 2 impact) and smooth lines (impact of no structure change).

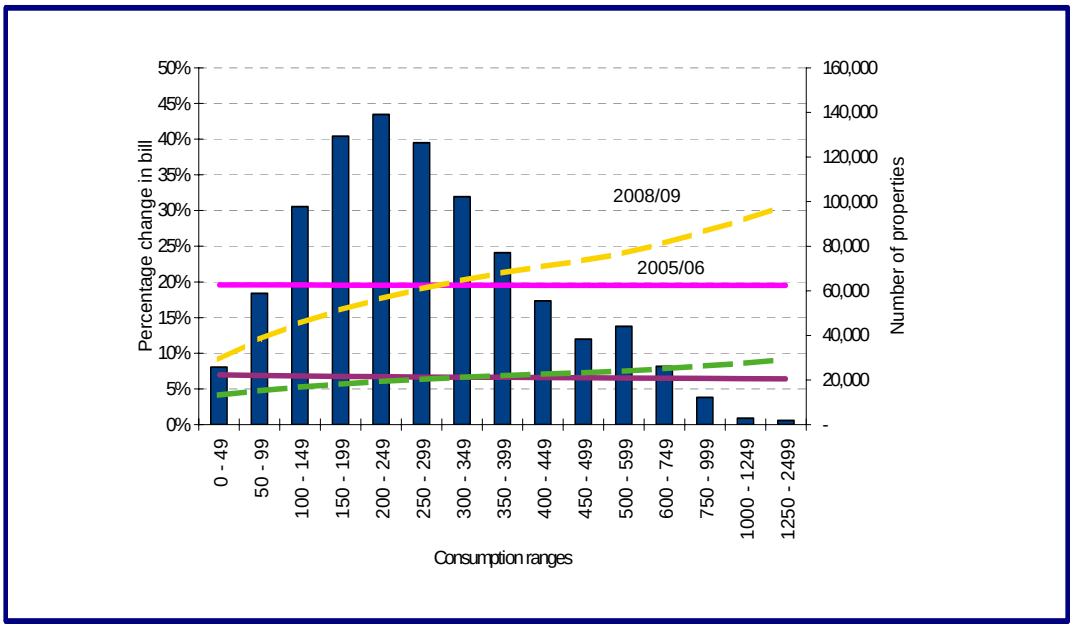

Figure 24: 2004/05 to2008/09 annual real water and sewer bill impact for metered house customers (larger usage component compared to no structural change)

The difference in impact of the above two options on households is marginal, apart from high water using households.

Residential flat and unit customer impacts

Option 1: Flat and unit customer impacts of a stepped price

The impact on customers residing in a flat or unit under the stepped option varies depending on consumption. This is demonstrated in Figure 25.

Flat and unit customers have a lower demand profile compared to other residential customers, therefore the main impact on their bill is an increase in access charges.

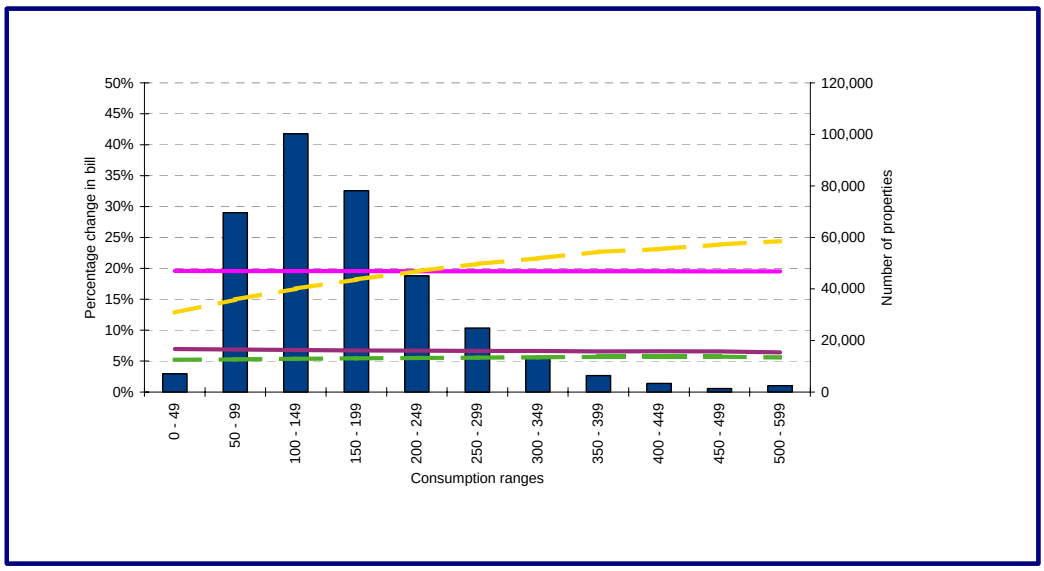

Figure 25: 2005/06 to 2008/09 annual real water and sewer bill impact for residential flats and units (stepped price compared with no structure change)

Option 2: Flat and unit customer impact of a larger usage charge component

As shown in Figure 26 flats and units with higher consumption levels experience a marginally higher bill increase with a larger usage component, compared with the step tariff option.

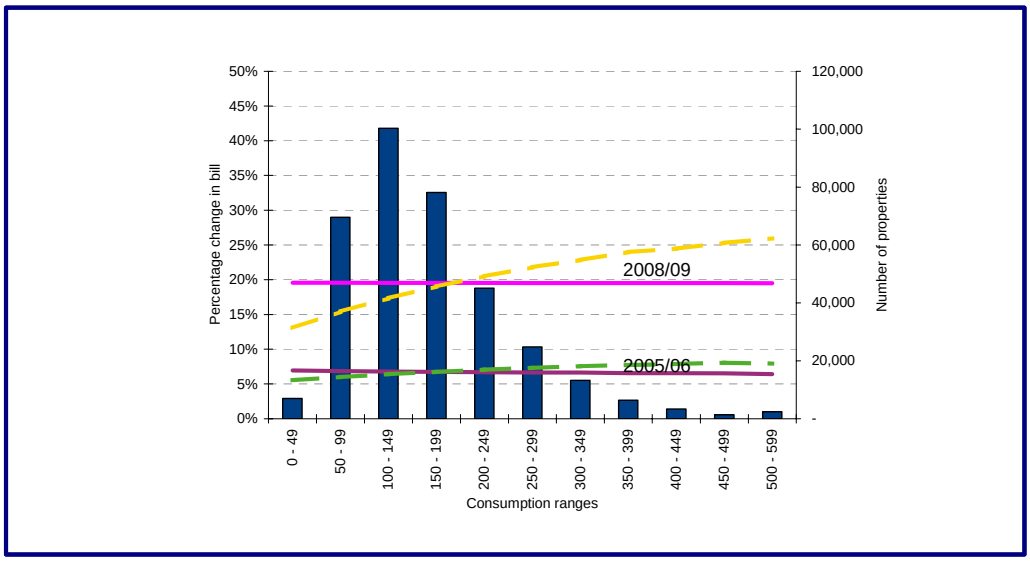

Figure 26: 2005/06 to 2008/09 annual real water and sewer bill impact for residential flats and units (larger usage component compared with no structure change)

Non-residential customer impacts

Non-residential customer impacts compared

Table 25 shows the percentage of non-residential customers by cumulative bill increase over the four years of the price path.

Table 25: Non-residential customers' bill impact (total water and wastewater bill)

Cumulative bill impact (2004/05 to 2008/09)	No structure change (percentage of properties)	Stepped price (percentage of properties	Larger usage component (percentage of properties)
0% - 10%	0%	50.9%	49.8%
10% - 15%	0%	17.8%	16.3%
15% - 20%	100%	22.4%	19.9%
20% - 25%	0%	8.5%	12.6%
Over 25%	0%	0.3%	1.4%

This analysis indicates that:

- with no structure change all customers would experience a bill increase of between 15 and 20 per cent over the four years to 2008/09;
- under both structure change options the majority of customers receive a bill impact below 15 per cent; and
- both structure change options result in higher increases for some customers than under no structure change.

Sydney Water's non-residential customer profile is more diverse than the residential sector. In calculating bill impacts Sydney Water has taken into consideration non-residential customers' meter sizes, discharge factors and consumption levels. Table 26 outlines the bill impacts of no structure change and the two structure change options for three types of non-residential customers.

Table 26: Non-residential customers' percentage change in total water and sewer bill

Non-residential Sample customer types	Percentage change in total bill Cumulative real impact – 2004/05 to 2008/09		
	No structure change	Stepped price	Larger usage component
Small business (160 kL/pa)	19.5%	14.8%	15.5%
Medium business (3300 kL/pa)	19.4%	18.4%	19.7%
Large business (285000 kL/pa)	19.4%	19.1%	20.5%

A comparison of impacts across the three representative groups indicates:

- all non-residential customers experience a relatively uniform impact under no structure change;
- there is only a marginal difference in impacts between the two structure change options;
- high users have a larger price increase than small users under both structural change options, appropriately however, all users experience a significant price rise.

7.3.5 Water only customer impacts

Approximately 50,600 (3 per cent) of Sydney Water customers only have a water service, that is, they are not connected to wastewater or stormwater networks.

If there were no structure change, with all prices increasing uniformly, there would be no unique impact for water only customers. However under the structure change options, while these customers face the same increases in water prices as all other customers, because their total bill is solely water related their total bill impact may be different.

This is perhaps best demonstrated by comparing impacts on water only versus water and wastewater customers. The following table shows the cumulative per cent bill increase over four years and the average annual bill increase (in dollars) for a selection of properties.

Table 27: Cumulative real bill increase 2005/06 to 2008/09 for customers taking water only

Customer type	Stepped tariff option				Increased usage price option			
	Water only		Water and sewer		Water only		Water and sewer	
	Bill Incr.	Avg/ annum	Bill incr.	Avg/ annum	Bill incr.	Avg/ annum	Bill incr.	Avg/ annum
House using 100 kL	11%	$5	13%	$16	12%	$5	13%	$17
House using 500 kL	35%	$50	27%	$62	29%	$43	23%	$54
Home unit	27%	$13	18%	$24	30%	$14	19%	$25
Small business	17%	$10	15%	$22	18%	$11	15%	$23
Medium business	30%	$269	18%	$306	32%	$290	20%	$328
Large business[1]	34%	$24.4k	19%	$25.4k	36%	$26.3k	20%	$27.3k

Note:

1. k denotes thousands of dollars.

While the water only properties face bigger increases in percentage terms, invariably their dollar increases are lower than for their water and wastewater counterparts because their total bills are relatively smaller.

Throughout this submission Sydney Water has argued in favour of customers paying prices that reflect the true cost of service. These prices reflect the costs associated with water service delivery and, unless there are mitigating circumstances, all water users ought to face the same price signals relative to their usage, regardless of what other Sydney Water services they may use.

7.3.6 Water, wastewater and stormwater customer impacts

Around 450,000 (26 per cent) of Sydney Water customers are within the hydrological catchment of a Sydney Water owned stormwater channel. In addition to water and wastewater, these customers incur Sydney Water stormwater charges (currently a flat $25.04 per year per household or vacant parcel of land and $70.64 per non-residential property).

With no price structure change, stormwater pricing is not a specific issue as prices will merely move in line with all other services. However, if there were no structure change, the costs of stormwater would be significantly subsidised by water and wastewater users' payments. This cross-subsidisation is addressed under Sydney Water's structure change proposals.

Stormwater prices will need to increase by a cumulative average of around 60 per cent in real terms over the next four years if Sydney Water is to achieve full cost recovery and a 6.5 per cent rate of return on stormwater assets by 2008/09. This takes into account:

- an ongoing stormwater renewals program over the next four years (in comparison to the regulatory value of stormwater assets); and
- past determinations by the Tribunal that removed non-residential property value based stormwater charges (approximately 30 per cent of stormwater revenue) without a compensating price restructure or increase.

While the required percentage increase in stormwater prices seems large in percentage terms, for a household it only means an average increase of around $4.75 per annum ($0.09 per week) over the four years and around $10.25 per annum ($0.20 per week) for a non-residential customer.

The following table shows the cumulative per cent bill increase over four years and the average annual bill increase (in dollars) for a selection of typical properties, assuming they have either water, wastewater and stormwater services or only water and wastewater services. The table demonstrates that customers receiving water, wastewater and stormwater services face a slightly larger bill increase than those who have water and wastewater services only.

Table 28: Cumulative real bill increase 2005/06 to 2008/09 for customers taking water, wastewater and stormwater services compared to water and sewer customers

Customer type	Stepped tariff option				Increased usage component option			
	Water, sewer, stormwater		Water and sewer		Water, sewer, stormwater		Water and sewer	
	Bill incr.	Avg/ annum	Bill incr.	Avg/ annum	Bill incr.	Avg/ annum	Bill incr.	Avg/ annum
House using 100 kL	15%	$21	13%	$16	16%	$22	13%	$17
House using 500 kL	28%	$67	27%	$62	25%	$59	23%	$54
Home unit	21%	$29	18%	$24	22%	$30	19%	$25
Small business	20%	$32	15%	$22	20%	$33	15%	$23
Medium business	19%	$316	18%	$306	20%	$338	20%	$328
Large business[1]	19%	$25.4k	19%	$25.4k	20%	$27.3k	20%	$27.3k

Note:

1. k denotes thousands of dollars.

7.3.7 Summarising customer impacts

This analysis demonstrates that a larger usage component and an inclining block tariff result in relatively smaller impacts for small water users and relatively large impacts for large users compared to no tariff restructure. Customer impacts are more severe for large consumers under the stepped price option.

7.4 MANAGING CUSTOMER IMPACTS

As a supplier of important infrastructure services, Sydney Water must balance commercial objectives with its regard for the interests of the community it serves.

In determining water prices the Tribunal must also consider the implications for customer affordability, in particular for specific customer groups such as large families, low-income households and pensioners.

Sydney Water has consulted with key community stakeholders on customer impacts of proposed price structure models. The stakeholders consulted include the Public Interest Advocacy Centre (PIAC), Council of Social Services of New South Wales (NCOSS), Combined Pensioners and Superannuants Association and Energy and Water Ombudsman New South Wales (EWON). All stakeholders were consistent in their support of Sydney Water's water conservation goals and the need to send a strong message to consumers about water conservation. At the same time, stakeholders emphasised the importance of measures to mitigate the impact of price structure change on large families, the 'working poor' and pensioners.

The following section outlines current arrangements administered by Sydney Water to assist households in financial difficulty. The next section identifies proposed extensions to these arrangements to accompany water price restructuring.

7.4.1 Existing mitigation initiatives

To mitigate the impact of price increases Sydney Water currently offers a number of programs to help households in financial hardship reduce their overall water consumption and/or pay their Sydney Water account. These services also support Sydney Water's conservation objectives. These initiatives are:

- **Free residential retrofits**

  Sydney Water's Residential Retrofit program is offered free of charge to holders of a Centrelink Health Care Card, Pensioner Concession Card and Department of Veterans' Affairs Gold Card, as discussed in Section 7.1. The program is available to all other households at the subsidised rate of $22 (the average Sydney Water operating cost of each retrofit is $130 per household).

  The Residential Retrofit program includes the services of a professional plumber to replace current showerheads with a new AAA rated water efficient model, install AAA rated water efficient aerators or flow regulators in kitchen and bathroom sinks, plus, for single flush toilet cisterns, adjust the float valve or install a water saving cistern weight. The retrofit provides savings of approximately 21 kL/ year for an average sized family, representing a saving of approximately 7 per cent off the water usage bill (3 per cent off the total bill) and 5 per cent off the energy bill.

  Uptake of the Residential Retrofit program has been strong, with Sydney Water completing over 100,000 free residential retrofits to accredited cardholders since the program's introduction in 1999. This represents 42 per cent of the 236,800 total retrofits completed by July 2004.

- **Pensioner rebates**

  Sydney Water administers NSW Government funded water and sewage rebates to assist pensioners. The program is available to people on the Age, Disability Support and Service pensions.

Pensioner rebates are available to holders of a Pensioner Concession Card, Department of Veterans' Affairs Gold Card embossed with TPI/TTI or war widow/widower or Extreme Disablement Adjustment (EDA).

The rebates apply to houses and home units (strata or company title) that are owned and occupied by an eligible customer. Eligible customers may also be entitled to a rebate if they are occupants of a retirement village on a long-term lease arrangement.

In 2003/04 Sydney Water issued rebates to approximately 215,000 pensioners. The average pensioner rebate was $334 per annum comprising 100 per cent on the water service charge and 74 per cent on the sewer service charge. This is the most generous pensioner rebate in Australia.

- **Extended payment arrangements**

  Sydney Water offers extended payment arrangements to customers who cannot pay their accounts. To obtain this, customers must contact Sydney Water to arrange a deferred payment date or an instalment plan.

- **Payment Assistance Scheme**

  The Sydney Water Payment Assistance Scheme (PAS) allows participating welfare agencies to issue $25 vouchers to residential customers requiring hardship relief for payment of their Sydney Water account. Sydney Water funds PAS as a cost of business and has committed $2 million in funds per year to the scheme.

7.4.2 Proposed expanded mitigation initiatives

Although Sydney Water currently has an extensive safety net program, following a price structure change, there is likely to be an increase in the number of households requiring assistance with minimising their water usage and subsequent water usage accounts. Those primarily impacted would be large households consuming relatively large amounts of water for essential household uses.

Based on ABS Census data there are a number of households in Sydney Water's area of operation with six or more occupants. Some of these households consume in excess of 100 kL/quarter. In cases where most of this consumption is for within-house use, these households may have fewer opportunities to reduce water consumption in response to price increases.

Sydney Water proposes to assist large households to decrease their water use through sustainable water conservation initiatives such as targeted retrofits and an interest free loan assistance program. These initiatives will provide the dual benefit of reducing water consumption and mitigating the impacts of price structure change on household disposable income. Such an approach is preferred to offering ongoing rebates on water usage, which are costly, difficult to administer, and tend to undermine water conservation objectives.

- **Targeted residential retrofits**

  The Sydney Water Residential Retrofit program will actively target high water consuming households, ie. households consuming in excess of 100 kL/quarter, including large families. For a seven-person household consuming in excess of 100 kL/quarter, a residential retrofit is expected to provide annual water savings of greater than 34kL, annual energy savings of approximately $48 and annual water savings of $48.[54]

  Furthermore, the Residential Retrofit program will be offered free of charge to households assessed by accredited welfare agencies as being in financial hardship. To increase awareness of the free retrofit offer, Sydney Water will actively target:

  - **low-income households**: target specific postcodes or regions based on research (such as Tony Vinson's report on 'Community adversity and resilience', March 2004) on the distribution of the socially disadvantaged in Sydney Water's area of operation;

[54] These savings are based on the increased usage charge option, outlined in Section 7.2.9.

- **vulnerable large families**: target vulnerable large families to the extent we can identify this segment of the community. Sydney Water will enlist the support of the welfare and community sector in promoting the Residential Retrofit program to this group; and
- **tenants**: target tenants as they are largely under-represented in the uptake of the Residential Retrofit program.

This initiative will build on Sydney Water's current Residential Retrofit program and utilise existing demand management program funds.

- **Assistance with purchase of water efficient appliances**

  Sydney Water will contribute up to $375,000 in initial funds to a selected accredited program that works with households in financial hardship to purchase accredited water efficient appliances at no interest. This initiative will result in no increase in Sydney Water's operating expenditure, as Sydney Water's demand management program will provide initial and ongoing funds.

  For a seven-person household, the annual water savings associated with a AAAA washing machine is approximately 37 kL with the annual dollar savings from the water bill of $52.[55]

  A possible existing program partner is the No Interest Loans Scheme (NILS), which was established in 1981 by the Good Shepherd Youth and Family Service to assist low-income households to replace old whitegoods with new, efficient appliances. Where possible, loans are linked to Centrelink payments, which minimises repayment defaults. The program is currently utilised by Energy Australia, Country Energy and ACTEW, and administered by NILS via a network of community organisations.

Two additional safety nets being proposed to assist vulnerable customers are:

- **Increasing PAS availability to tenants**

  Some tenants residing in individually metered properties are responsible for payment of their water usage account. To mitigate the impact of price structure change on vulnerable households in rental accommodation, Sydney Water will extend the existing Payment Assistance Scheme (PAS) to provide tenants with access to assistance equal to property owners. PAS vouchers are currently limited to one (valued at $25) per quarter for tenants. This limitation does not apply to homeowners. The extended PAS will see accredited welfare agencies providing the required number of PAS vouchers to assessed households to assist them to pay their account regardless of whether they are property owners or tenants.

- **Retaining current pensioner rebate structure**

  Sydney Water currently administers pensioner rebates at an estimated cost of $69.5 million for 2004/05 to NSW Treasury as a Community Service Obligation (CSO). However, with service charges likely to increase under price structure changes the value of pensioner rebates may be revised.

  Under no price structure change, Sydney Water proposes to minimise the impact on pensioners by retaining the current pensioner rebate structure. As part of the price structure change package, the rebate will remain at 100 per cent of the water service charge and will progressively increase to 85 per cent of the sewer service charge over the price path from 2005/06 to 2008/09. Retaining the current rebate structure will result in pensioners receiving a price increase consistent with what other residential customers will experience.

  To support retaining the current rebate structure, the annual CSO would be increased as per Table 29. With the impacts of the increases on pensioners who are water only customers (approximately 4,200), Sydney Water proposes to retain the one third of 75 kL

[55] These savings are based on the increased usage charge option as outlined in Section 7.2.9.

per quarter water usage rebate. This is in addition to the pensioner rebate on their water services.

Table 29: Increase in community service obligation from 2004/05 to 2005/06

	No structure change	Option 1 (stepped price)	Option 2 (larger usage component)
Estimated increase	$4.9 million	$2.9 million	$4.4 million
Estimated total cost of CSO in 2005/06	$74.4 million	$72.4 million	$73.9 million

A further additional measure that could be considered in the case of an inclining block tariff structure is to provide some transitional arrangement for large households. For example, under the inclining block tariff structure, a large household that uses 125 kL a quarter would incur a higher charge for the 25 kL by which the consumption exceeds the step threshold of 100 kL. Under the tariffs proposed, this household would pay, in the first year, $17.88 more in that quarter than if the step tariff did not apply. In the fourth year the difference would be only $10.63.

It is estimated that there are around 35,000 households with greater than six people that use more than 100 kL in a quarter. These customers could be given a transitional concession or rebate in which the step tariff commenced only when quarterly usage exceeded 125 kL with this reducing to 100 kL at the end of the determination or at some interim time. Such a concession would be valued at up to $71.50 in 2005/06 for any one household. This measure would result in reduced revenue of around $1.7 million in the first year.

Based in seasonal usage patterns for these 35,000 households, it is estimated that around half use the excess water for outdoor discretionary usage. This means that the concession would also be obtained by households that are the specific target of a step tariff. However, since there is no way that Sydney Water can reliably confirm the number of people in a household or the purpose for which the water is used, a concession such as this would rely on customers' self declaration.

8 Other charges

Sydney Water provides a range of services such as trade waste disposal, recycled water and miscellaneous services. The pricing principles that have been applied to these charges are articulated in this section, with the details of the actual charges for specific services contained in appendices attached to this report.

The general pricing principles that have been developed for these services are based on ensuring:

- full cost recovery;
- where relevant, the pricing arrangements support the implementation of water conservation or effluent management initiatives;
- beneficiaries pay for services that they receive;
- prices are fair and equitable; and
- prices are practical to implement.

8.1 RECYCLED WATER

Water recycling is an important component in the suite of initiatives that can be implemented to mitigate demand pressure on Sydney's limited potable water supplies. To date, Sydney Water has pursued recycled water opportunities where economically and environmentally viable. The emphasis on water recycling and other water conservation initiatives takes place in an environment where the NSW Government has established clear obligations for new urban developments to conserve water. In some instances water recycling can be the most cost effective option to achieve these water savings.

The Tribunal has asked that Sydney Water develop and submit pricing principles covering recycled water. The Tribunal will consider these principles as part of the 2005 Determination.

8.1.1 Recycled water prices and potable water prices

When considering prices for recycled water it is important to recognise the relationship between recycled water prices and potable water prices. Customers' willingness to pay for recycled water depends on the price of alternative water sources and a range of other costs facing the customer in their decision to connect. If prices for potable water are set too low relative to recycled water, customers will not use the recycled water and recycled water schemes will fail to promote water conservation or environmental outcomes efficiently.

The first step in considering recycled water pricing principles is therefore to ensure that potable water is priced appropriately. Sydney Water believes that potable water prices should reflect long run marginal cost, where this cost reflects both financial and environmental costs. Setting potable water prices with regard to the scarcity value of water ensures customers have an appropriate benchmark against which to compare the costs and benefits of recycled water use.

The discussion of recycled water pricing principles in this section therefore assumes that in its Determination the Tribunal sets an appropriate potable water price by 2008/09. Section 7.2 of this submission suggests that the potable water price should increase from $1.01 at present to $1.40 by 2008/09 as a reflection of the opportunity cost of Sydney's water supply. If this is supported, the potable water price will allow customers to assess whether to invest in alternatives against the price of potable water.

8.1.2 Demand Management Fund

A Demand Management Fund has been established under the Metropolitan Water Plan to provide the private sector and other agencies with financial incentives to develop water savings and alternative supply initiatives. The Department of Energy, Utilities and Sustainability (DEUS) will develop selection criteria for the private sector's access to the Fund, which DEUS will administer.

The Demand Management Fund will allow any proposed recycled water scheme to seek a subsidy, which will improve its attractiveness to customers relative to the potable water price to be determined by the Tribunal.

8.1.3 Principles

Recycled water is a heterogeneous product that is characterised by different outcomes in terms of quality, cost, location and customer requirements of particular schemes, as well as alternative water supplies. As such, recycled water pricing principles need to be generic to accommodate these variable outcomes, and should also reflect Sydney Water's role in providing water and wastewater services, which is defined by its regulatory requirements.

These principles should also clearly reflect appropriate objectives for promoting recycled water use in Sydney. These objectives include efficiency, revenue sufficiency, transparency, simplicity of administration, and equity considerations.

Based on these objectives, Sydney Water's proposed principles for recycled water are that:

- Recycled water prices must recover the efficient cost of service provision, including the cost of capital determined by the Tribunal, having regard to Sydney Water's avoided costs where appropriate
- The price of recycled water schemes should be set on a scheme by scheme basis.

Where Sydney Water is the **wholesaler** of treated effluent or raw sewage to a recycled water provider, prices are established by a methodology previously determined by the Tribunal. Currently the Tribunal sets a zero charge for the effluent or treated sewage product, with the costs of extraction borne by the customer. Sydney Water accepts that this price should be based on the costs that Sydney Water incurs in providing access to its infrastructure, or avoids as a consequence of reduced sewage flows.

Where Sydney Water is the **retailer** of recycled water, recycled water prices should be set to recover the efficient costs of providing recycled water, taking into account any benefits to Sydney Water as a consequence of reduced sewage flows and/or reduced demand for potable water.

8.1.4 Pricing of Recycled Water

Sydney Water proposes to set recycled water prices on a two part tariff basis consistent with COAG principles and current charging structures for potable water, with cost recovery based on the building block methodology applied by the Tribunal to determine revenue requirements.

However, given the variability of individual recycling projects in terms of costs, potable water and/or sewage management benefits and, more importantly, the dictates of individual markets in terms of quality, Sydney Water does not support postage stamp prices being set for recycled water. Rather, prices should be determined on a scheme by scheme basis having regard to these factors. The mix between fixed and variable charges for recycled water should also be determined on a scheme by scheme basis with regard to the circumstances and objectives of the particular project.

Where recycled water schemes are proposed for new-growth areas, cost recovery will be achieved via a combination of developer charges and periodic charges, in line with the Tribunal's current Developer Charges Methodology for recovering the costs of water and wastewater services to new growth areas. Again, the mix between up front developer contributions and periodic fixed and variable charges for recycled water would need to be determined on a scheme by scheme basis.

Sydney Water will develop clear guidelines in consultation with the Tribunal for this process. Sydney Water will also continue to report to the Tribunal on implementation of these schemes to ensure there is no double counting between developer charges and the recycled water price in recovering costs for these schemes.

The Tribunal should endorse these principles and could participate where agreement cannot be reached between Sydney Water and customers on the recycled water price proposed on a scheme by scheme basis.

8.1.5 Implementation issues

Sydney Water's proposed recycled water pricing principles are to be applied on a scheme by scheme basis for both residential and non-residential projects. Appropriate prices will be determined for each scheme using Sydney Water's current charging structure, which is based on the two part tariff currently applicable to potable water prices, in combination with developer services charges where appropriate.

Sydney Water also supports third party recycled water schemes being considered for subsidies from the Demand Management Fund to be administered by DEUS. Such subsidies will reduce the price customers face for recycled water projects relative to the potable water price, thereby improving the potential viability of many schemes.

8.2 TRADE WASTE

Sydney Water's trade waste program is a vital tool in managing the potentially damaging impacts of trade waste on the environment, and on Sydney Water staff and assets.

Trade waste charges should be cost reflective and transparent and determined according to the principle that the 'user pays'. Trade waste charges provide customers with a clear indication of the costs associated with acceptance, transport and treatment of waste products, and these charges provide an incentive for customers to reduce discharges or invest in on-site waste treatment.

Sydney Water's pricing policies also provide an important incentive for industry to invest in effluent improvement programs. Customers who implement effluent improvement programs may qualify for the waiving of any critical substance charges and also qualify for discounts in certain other quality charges. The rationale for these price adjustments is to reduce the overall discharge load on the wastewater system by working with industry to find solutions and lower effluent concentrations.

This submission seeks only minor alterations to the current pricing strategy and is designed to complement recent changes to the *Trade Waste Policy*. These changes are consistent with Sydney Water's objectives in providing a trade waste acceptance service, and in particular have been designed to support the Corporation's long-term objectives in promoting water conservation and cleaner production alternatives for business customers.

The trade waste pricing principles are in line with the guidelines contained within the National Water Quality Management Strategy, 1994 (Guidelines for Sewerage Systems, Acceptance of Trade Waste), and the principles determined by the Trade Waste Charges Working Group set up by NSW Treasury in 1994 and outlined in its final report of 1997. The proposed changes contained within this submission are also consistent with these principles.

A complete description of the approach to trade waste pricing and a listing of all charges for trade waste is contained in Appendix E.

8.2.1 Schedule of charges

There are three categories of charges that relate to trade waste services:

- **administrative charges:** these charges relate to the costs (principally labour costs) involved in generating and maintaining discharge agreements;
- **quality charges:** there are two types of standard quality charges – domestic – which are a combination of cost recovery and incentive based charges, and non-domestic – which are primarily incentive based, but set in order to achieve the desired wastewater quality to permit discharge of effluent in compliance with discharge licences, beneficial use of biosolids and safe transportation. The former charges vary for each chargeable substance and reflect the costs of accepting, transporting and treating specific waste products. Biochemical Oxygen Demand (BOD) and sulfate charges vary as the concentration of each substance in the discharge increases, reflecting increases in costs associated with treatment and harm to Sydney Water's wastewater system. The latter, non-domestic incentive based charges are triggered when the effluent levels exceed acceptance standards; and

Other charges

- **critical substance charges:** these quality charges are established as multiples of the specific quality charges and are used to set a price signal to limit loads of specific substances in the system.

8.2.2 Financial implications of proposed changes to trade waste charges

Sydney Water currently receives approximately $20 million from all trade waste charges per year, and this amount is not expected to significantly change over the years 2005/06 and 2006/07. The forecasted changes to revenue and costs to 2006/07 are shown in Table 30 below.

Table 30: Trade waste revenue, expenditure and projections 2003/04 to 2006/07

Value ($million 2004/05 dollars)	2003/04 actual	2004/05 budget	2005/06 projected	2006/07 projected
Trade waste expenditure				
Administration costs	$5.50	$5.49	$5.49	$5.49
Treatment costs	$3.50	$3.50	$3.50	$3.50
Transport costs	$3.50	$3.50	$3.50	$3.50
Wastesafe payments to depots	$5.50	$5.50	$5.50	$5.50
Wastesafe operation and admin costs	$0.85	$0.89	$0.89	$0.89
IT and R&D costs	$1.00	$1.00	$1.00	$1.00
Total expenditure	*$19.85*	*$19.88*	*$19.88*	*$19.88*
Trade waste revenue				
Administration fees	$2.50	$2.85	$2.50	$2.50
Quality charges – industrial	$7.78	$7.99	$7.40	$7.10
Quality charges – commercial	$2.92	$2.92	$2.92	$2.92
Critical substance charges	$0.44	$0.44	$0.41	$0.38
Wastesafe revenue	$6.87	$6.87	$6.87	$6.87
Total revenue	*$20.51*	*$21.07*	*$20.10*	*$19.77*
Difference	$0.66	$1.19	$0.22	-$0.11

8.2.3 Forecast impacts on customers due to proposed changes

The only significant impact on trade waste customers' charges will be due to the introduction of the total dissolved solids (TDS) pricing strategy. Many customers' trade waste charges will increase due to TDS charges, however, the proportional impact will vary with most customers

experiencing only minor increases. More detail on customer impacts is provided in Appendix E.

8.3 MISCELLANEOUS SERVICES

Miscellaneous services are generally requested by customers when buying and selling properties, building, connecting new plumbing or when developing land.

Sydney Water has undertaken a comprehensive review of these services to ensure that these charges reflect the costs of supply and that Sydney Water continues to provide these services in an efficient manner.

In order to lower service costs Sydney Water has also embarked on an initiative to improve services to customers and to drive internal efficiencies. This program has led to a significant lowering in the costs of supply of a number of services, and has allowed Sydney Water to rationalise its service delivery processes, including the closure of a number of service counters.

Sydney Water applies the fully distributed cost methodology to calculate charges for miscellaneous services. Sydney Water does not include a profit margin in calculating the charges for these services. Miscellaneous charges are calculated according to the following formula:

Miscellaneous charge = base cost + material cost

The methodology is consistent with the approach adopted by the Tribunal in its September 2000 and May 2003 Determinations.

In 2003/04 miscellaneous services provided Sydney Water with revenue of $13.5 million.

Sydney Water proposes that the Tribunal adopts the proposed prices outlined in Appendix F for 1 July 2005 to 30 June 2006. For subsequent years within the regulatory period, it is proposed to increase prices based on the increases in Sydney Water's labour costs from the start of the next financial year in which they occur.

8.3.1 Late payment fee

Sydney Water incurs considerable expense in administering overdue accounts. These costs are ultimately borne by all customers, including those who pay on time. At present, only 41 per cent of Sydney Water customers pay on time. The remaining 59 per cent of customers pay outside of the scheduled 21 day account period.

Sydney Water is proposing to introduce a $5.50 late payment fee inclusive of GST to encourage late-paying customers to pay water bills within the required payment period (21 days after issue). Customers experiencing genuine difficulty paying bills would be protected through a series of exemptions.

The introduction of a late payment fee would encourage customers to pay bills within the account period. Where customers continue to pay their water bills late, the fee would partially compensate Sydney Water for the associated costs. The costs would also be recovered from those customers who generate these costs, rather than being borne by all consumers.

The introduction of a late payment fee would align Sydney Water's credit facilities for overdue accounts with policies adopted in other utilities.

The late payment fee would operate along with existing interest charges and would apply to residential and business customers. Penalties for overdue account balances would be the greater of the late payment fee of $5.50 and interest charges. Late payment fees will be limited to a maximum of one per bill as per Tribunal guidelines for energy utilities.

Sydney Water's current cost of managing credit is approximately $3.3 million per year. It is estimated that revenue from a late payment fee would be approximately $1.325 million in the first year and $850,000 in the second full year as customers change their payment patterns. Whilst the revenue from the proposed fee does not cover all credit management costs, the proposed $5.00 (plus GST) is considered to be a sufficient and suitable incentive for on time payment for a significant number of customers.

Sydney Water will encourage customers who cannot pay their account by the due date to contact Sydney Water to organise alternate payment arrangements. It is proposed that the following customers are to be exempt from the late payment fee:

- residential customers who have entered into an arrangement with Sydney Water for deferred payment or payment by instalments;
- customers disputing their account through either the Energy and Water Ombudsman NSW or another external dispute resolution body; and
- on a case by case basis as considered appropriate.

Further background and details of the proposal are contained in Appendix F.

8.3.2 Sewage services rendered to exempt properties – charge

Sydney Water's proposal is to maintain the current charge of $80.38 per water closet or urinal closet in real terms for each year of the new price path (see Table 24: Minor miscellaneous charges, Appendix H).

As part of the Tariff Rationalisation process for exempt charges outlined below, council and other park owners will be required to pay full charges for parks in line with State Government and privately owned parks. This property type currently represents approximately half of the exempt properties that receive a sewage services rendered charge.

Sydney Water is committed to reviewing the remaining exempt properties that will be subjected to this charge, at the next price review, as part of the on going Tariff Rationalisation agenda.

Therefore, Sydney Water seeks no real change in the charge for sewage services rendered to exempt properties.

8.3.3 Metered standpipe charges

Metered standpipe charges are as set out in Table 24: Minor miscellaneous charges in Appendix H. The proposed service (annual availability) and usage charges reflect the proposed water charges for metered properties.

8.4 TARIFF RATIONALISATION

Sydney Water is proposing a series of changes to tariff rules to reduce tariff complexity, lower administrative costs, improve customer understanding and send stronger demand management signals. In some cases the proposed tariff changes also assist in achieving other objectives, such as improving environmental outcomes by mitigating incentives for illegal discharges.

The proposed changes are summarised below. The details of the proposed tariff changes are contained in Appendix G.

8.4.1 Meter size based service charges for residential properties

Under current pricing arrangements, water service charges (the fixed charge) for almost all customers are based on the size of the water meter serving their property. Commercial and industrial users with larger meters pay higher charges, while residential home units and flats that share a common meter have their total water service charge based on the size of the meter serving their complex. For separate billing of each dwelling (for example strata title home units), the resultant service charge is divided by the number of dwellings in the complex. Per dwelling, this may result in a lower service charge than that applicable to an individually metered property with the standard 20mm meter.

Houses are currently the only group to which meter size based water service charges do not universally apply. Of the one million or so houses supplied by Sydney Water, only 23,500 (2 per cent) have meters larger than the standard 20 mm.

Approximately a third of the properties with a larger meter size have a block size in excess of 10,000 square metres with many located on the outskirts of Sydney. Consumption is well

above the residential average with the majority of properties being classified as high water users consuming in excess of 400 kL per annum.

It is proposed to charge the water service charge for houses on the basis of the water meter serving their property.

In addition to standardising water charging for all customers, universal application of meter size based service charges would address a current inequity. The majority of customers contribute to system costs on the basis of their "capacity to use" while a minority of houses with meters greater than 20 mm, pay on a 20 mm basis even though they have a greater 'capacity to use' the system.

Sydney Water will also provide an amnesty period of six months to allow customers to downsize their meters if they choose. This would allow them to avoid additional charges associated with the larger meter size.

8.4.2 Exempt charges

It is proposed to change the way charges are levied on exempt properties.

For metered properties it is proposed that:

- council and other park owners would be required to pay full charges for parks in line with State Government or privately owned parks.

For unmetered properties it is proposed that either:

- these properties be metered wherever it is economical to do so to ensure that they pay for the water they use; or
- introduce a nominal charge for water usage levied on unmetered non-residential properties to cover estimated water usage.

8.4.3 Blue Mountains septic pump-out

To improve environmental outcomes it is proposed to change the scheme to encourage customers to connect to the existing sewerage system and to discourage practices that are detrimental to the environment. The main features of this proposal are:

- retain the Blue Mountains septic pump-out scheme's current cost recovery arrangements for properties that do not have sewer services available for the next price path period;
- restructure the regulated two-tiered usage tariff system to reduce the number of illegal sewer discharges;
- increase the financial incentives to connect for customers who have sewer services available; and
- establish a subsidised connections program for pump-out customers, particularly for those in hardship.

8.4.4 Pumping of effluent

In 1988, there were around 700 Sydney Water customers that pump effluent into the sewer. Under the current policy, these customers are subsidised by Sydney Water. It is proposed to charge customers currently receiving this cross-subsidy the full sewer service charges. This increase in charges would be introduced in staged increments over the price path.

8.4.5 Land area distinction within Rouse Hill drain area

It is proposed to remove the drainage land area charge for customers over 1,000 square metres in the Rouse Hill area. Sydney Water proposes to apportion the charge over all Rouse Hill drainage customers from 1 July 2005.

8.4.6 Equivalent water usage for unmetered non-residential properties

It is proposed to charge a nominal water usage charge (equivalent to 120 kL per annum) to unmetered non-residential properties to cover estimated water usage. The reform ensures

that all unmetered non-residential properties pay a nominal charge for water usage. The start date for this proposed price change is 1 July 2005.

8.5 ROUSE HILL

Sydney Water proposes to maintain all Rouse Hill development area charges constant in real dollar terms, as set out in Table 25: Rouse Hill development area charges in Appendix H.

The recycled water usage and water service access charges are to be adjusted for inflation. River management charges within the Rouse Hill drainage area, will also be adjusted for inflation, in addition to the proposed reform of this tariff charge, as outlined in Section 8.4.5.

Sydney Water has proposed to maintain Rouse Hill charges constant in real terms, for the next price path, to assess the impact of the Tribunal's recommendations on the recycled water pricing principles outlined in Section 8.1. The Tribunal's decision will have an impact on the recycled water charges that are currently applied to the Rouse Hill development area.

8.6 PRIORITY SEWERAGE PROGRAM

Sydney Water seeks the Tribunal's endorsement of the implementation of Low Pressure Sewerage Systems (LPSS) under the Tribunal's Determination No.4, 1997 for Pricing of Backlog Sewerage Systems.

LPSS use individual pumps located within collection tanks on customer's properties and small diameter pipes to pump sewage through the street pipe network to a sewerage treatment plant. LPSS is an alternative servicing strategy in backlog sewerage areas where topography, geology or environmental sensitivities make the provision of conventional gravity systems uneconomical and/or highly disruptive to the community.

The adoption of LPSS technology can:

- reduce Sydney Water's total life-cycle costs;
- reduce the property owners cost to connect; and
- provide environmental benefits, by reducing risks in constructing and operating a sewerage system in difficult terrain or environmentally sensitive areas.

For villages under the Government's PSP, all existing properties within the defined subsidised service area are provided with access to an improved wastewater service. To provide customers' access and encourage connection to the system, Sydney Water will pay for the costs of supplying and installing LPSS equipment and pipework for up to two years after the reticulation system becomes available.

After the two year period, Sydney Water will supply, free of charge, the equipment for the LPSS (collection tank, pump, alarm panel and boundary kit). The customer will be responsible for paying for all costs for organising and installing the LPSS on their property. The customer will be required to use an accredited Water Service Coordinator to organise the installation. Sydney Water will be responsible for operating and maintaining the LPSS on the customer's property up to and including the pump unit.

The customer will be responsible for:

- payment of the standard connection fee and annual sewer service charge as determined by the Tribunal;
- payment of the cost of electricity required to operate the pump and its controls, estimated at up to $32 a year, and will be more than offset by the customers' reduced cost of connection. This user pays scenario has been adopted in other LPSS schemes within Australia and overseas as it provides an incentive to the user to reduce water consumption and minimise electricity costs; and
- the cost of connecting from the customers existing sewer to the LPSS collection tank.

9 GLOSSARY

Average Dry Weather Flow (ADWF)	The flow of sewage produced on a typical day in dry weather.
BASIX	Building Sustainability Index (BASIX) is a planning tool designed to assess the water and energy efficiency of residential developments.
Biosolids	Solid waste (or sludge) separated from sewage effluent during treatment.
Catchment	The area drained by a stream or body of water or the area of land from which water, stormwater or sewage is collected.
Customer Contract	A document setting out the terms, rights and responsibilities of the customer and Sydney Water.
Effluent	The liquid product of sewage treatment that is discharged into the environment or re-used. The quality of effluent provided by the treatment plant will depend on the treatment processes used. Where effluent is to be re-used it will be treated to achieve a quality required by current State and National guidelines.
Exfiltration	Leakage of sewage from defects in sewers to the surrounding soil and environment.
Inclining block tariff	A two-tier usage where a price applies to each kL of water used up to a certain volume and a (higher) usage price would apply to each kL of water used in excess of that volume.
Net Present Value (NPV)	The difference between the present value of future benefits and the present value of future costs. Present values are calculated applying a discount rate to the future benefits/costs to convert them to an equivalent current value. For example using an annual discount rate of 10%, an amount of $1,000 in one year's time has a present value of $909, and an amount of $2,000 in two years time has a present value of $1,653.
Non-Potable	Water used for purposes other than potable.
Operating Licence	A document that defines Sydney Water's performance standards. The licence is granted under Section 12 of the Water Board (Corporatisation) Act.
Outfall	Effluent discharge point into the receiving environment.
Overflows	Untreated or partially treated discharge of sewage (under wet and dry weather) from a sewerage system. They can occur at either designed overflow structures or other points in the system. Exfiltration and odours are also considered overflows.
Potable	Water used for drinking, washing and cooking.
Primary Treatment	A waste water treatment method that uses screening, settling and skimming to remove solids and floating materials from waste water.

Receiving Water	A stream, river, pond, lake, harbour or ocean into which discharges (effluent or overflows) flow.
Residuals	Waste products left over from treatment process.
Reticulation	The network of small diameter pipelines collecting sewage under gravity flow.
Re-use	Use of effluent for purposes other than disposal to the receiving environment.
Rising Main	Pressure pipeline in which water or sewage flows due to pumping.
Secondary Treatment	A waste water treatment method that usually involves the addition of biological treatment to the screening, settling and skimming provided by primary treatment.
Sediment	Particulate organic and inorganic matter that settles to the bottom of lakes, rivers, oceans and other waters.
Sewage	The domestic and industrial waste conveyed in sewers.
Sewerage System	The system of pipes and sewage pumping stations through which sewage flows (see also 'Reticulation').
Stormwater	Rainwater which runs off urban and agricultural catchments, often carrying rubbish and animal droppings, sewage overflows, grass clippings and heavy metals from car exhausts. This untreated water is carried in stormwater channels and discharges into creeks, rivers, the harbour and the ocean.
Telemetry	Transmission of information by radio waves and/or by telephone cable.
Tertiary Treatment	A stage of sewage treatment which incorporates 'polishing' and produces effluent of higher quality than that produced by primary and secondary treatment.

10 ABBREVIATIONS

%	per cent
ADWF	average dry weather flow
AMPs	asset management plans
ANZSIC	Australian and New Zealand Standard Industry Classification
BOD	biochemical oxygen demand
BPF	business planning framework
CEPA	Centre for Efficiency and Productivity Analysis
COAG	Council of Australian Governments
CPI	consumer price index
CSO	community service obligation
DEA	data envelopment analysis
DEC	Department of Environment and Conservation
DEUS	Department of Energy, Utilities and Sustainability
DIPNR	Department of Infrastructure, Planning and Natural Resources
FBT	fringe benefits tax
FMECA	Failure mode effects and criticality analysis
FPRC	Financial Performance and Review Committee
GIS	geographic information system
GL	gigalitres (1,000,000,000 litres)
kg	kilogram
kg/d	kilograms per day
kL	kilolitre
kL/d	kilolitres per day
km	kilometre
kW	kilowatt
L	litre
lcd	Litres per capita per day

LPSS	Low pressure sewerage system
LRMC	Long run marginal cost
m	metre
mg/L	milligrams per litre
ML	megalitres (1,000,000 litres)
ML/d	megalitres per day
NPV	net present value
NPV	Net present value
NSW	New South Wales
P	phosphorus
pa	per annum
PAS	payment assistance scheme
PIAC	Public Interest and Advocacy Council
PIR	Post implementation review
PSCMs	performance specified maintenance contracts
PSP	Priority Sewerage Program
RAB	Regulated asset base
RCM	Reliability Centred Maintenance
RTA	Roads and Traffic Authority
SCA	Sydney Catchment Authority
SCAMPs	Sewer Catchment Asset Management Plans
SEIP	Stormwater environment improvement program
SFA	Stochastic frontier analysis
SOE	Standard operating environment
SOLP	Sewerage Overflows Licensing Project
SPS	sewage pumping station
SRMC	Short run marginal cost
STAMPs	Sewer Trunk Asset Management Plans
STP	sewage treatment plant

STP	Sewage treatment plant
SWSOOS	Southern and Western Suburbs ocean outfall sewer
Sydney Water	Sydney Water Corporation
TDS	total dissolved solids
TFP	total factor productivity
the Council	the National Competition Council
the Issues Paper	*Review of Metropolitan Water Agency Prices, Issues Paper*, June 2004
the Tribunal	the Independent Regulatory and Pricing Tribunal
WACC	Weighted average cost of capital
WSAA	Water Services Association of Australia

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APPENDICES

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Appendix A – Sydney Water's economic performance

This appendix contains more detailed information on:

- how economic performance can be measured and comments on measurement approaches used by regulators including the Tribunal; and
- the results of Sydney Water's two comprehensive studies of economic performance which were discussed in Section 4 of the submission, ie. the Centre for Efficiency and Productivity Analysis (CEPA) study and the Frontier Economics study. These studies show that Sydney Water is technically efficient against a sizable sample of Australian and UK firms, and has achieved stronger productivity growth than other Australian water utilities, the combined electricity, gas and water utility sector (as measured by the Productivity Commission) and the economy (as measured by the Australian Bureau of Statistics).

MEASURING ECONOMIC PERFORMANCE

As noted in Section 4 of the submission, economic performance is commonly measured using comprehensive measures of performance (which incorporate all key inputs and outputs) or partial measures of performance (which focus on individual inputs and outputs or processes).

Comprehensive measures

There are a number of techniques available that can be used to measure efficiency and productivity. Since the 1950s, there has been a large body of work and renewed interest in the development of efficiency and productivity measurement methodologies.

PRODUCTIVITY AND EFFICIENCY DEFINED

Productivity is the ratio of the quantity of outputs produced to the quantity of inputs used in production. That is:

$$TFP = \frac{Quantity\ of\ outputs}{Quantity\ of\ inputs}$$

Productivity can vary between firms and over time due to:

Technical change: new technologies that allow resources to be used more efficiently (also referred to in TFP studies as 'frontier-shift');

Technical efficiency: efficiency of resource use by the firm, which can be attributed to managerial and operating practices, regulatory and other characteristics of the environment in which firms operate;

Scale efficiency: efficiency that arises from operating at an optimal size; and

Allocative efficiency: minimising costs given the input prices faced by the firm.

The most commonly used techniques for measuring productivity include:

- production and cost functions estimated using either econometric approaches (regression or stochastic frontier analysis (SFA)) or a mathematical programming approach (data envelopment analysis (DEA)); or
- index number approaches, which is often referred to as Total Factor Productivity (TFP) analysis.

These comprehensive benchmarking techniques have been widely adopted in examining the productivity and efficiency of utility industries in Australia and

overseas, by both regulators (including the Tribunal and other regulators) and by regulated firms.

The defining feature of all of these productivity measurement techniques is that they provide comprehensive measures of economic efficiency and efficient costs that account, simultaneously, for the multiple inputs used and outputs produced by the regulated firms. Such an approach allows for analysis of the contribution of scale of operations to efficiency and also accommodates the different input substitution decisions made by firms in the industry.

However, the approaches vary in terms of the extent of information required (eg. whether both price and quantity data on inputs and outputs is required), whether comparisons are made against average or best performance, and in their ability to account for or isolate factors that impact on costs/efficiency but are outside managerial control, including scale.

A single comprehensive measure of the efficiency level and future scope for productivity gains, as produced by these top-down benchmarking techniques, is best suited to regulatory purposes. The regulator does not need to be concerned with where or how productivity gains will be made, just the overall quantum. The managers of the regulated firms are best placed to manage the process of achieving efficiency gains as they have the information and expertise required. However, many of the comprehensive benchmarking techniques do also produce partial indicators that can highlight areas of poor performance for the regulator and assist the managers to consider options for improving performance.

The following briefly describes the key performance measurement approaches.

Data Envelopment Analysis

DEA is a non-parametric benchmarking approach that compares performance to the best in the sample by constructing an efficient frontier using linear programming. DEA can be used to compare the performance of number of firms at a single point in time or a number of firms over time (using Malmquist DEA).

DEA has the following desirable capabilities:

- DEA can readily provide a range of efficiency scores that reflect different sources of efficiency including:
  - *technical inefficiency* – is the business obtaining maximum output from a given set of inputs?
  - *allocative inefficiency* – given input prices faced by a business, are they using a least cost mix of inputs?
  - *scale inefficiency* – is the business operating at the optimum size in terms of output level produced?
- unlike index number and econometric techniques, price information is not needed to obtain measures of technical efficiency using DEA. However, if both quantity and price data are available, DEA can be used to decompose efficiency into its technical and allocative components;
- DEA identifies relevant peers for each firm in the study that could serve as performance models, and indicates the importance of those peers; and
- it is possible to effectively account for operating environment characteristics that influence efficiency by directly including operating environment variables into the DEA model or by subsequent statistical adjustment of the DEA scores.

DEA is a well established and respected technique which has strong theoretical and empirical foundations. DEA has been widely used to measure economic

performance, including by the Tribunal and other regulators, in previous electricity distribution price reviews.

However, as with all modelling techniques, DEA has limitations. The limitations do not fundamentally undermine the technique, but must be considered when interpreting the results. The key limitation is that DEA is a deterministic rather than a statistical technique. This has two implications:

- the measures of efficiency may be sensitive to 'outliers' which can distort the efficient frontier and reduce the relative efficiency of other firms with similar mixes of inputs and outputs. It is therefore important to identify potential outliers. If these potential outliers are genuinely different organisations, or the data is not able to be verified, they should be removed from the sample; and
- no information is produced about statistical significance or confidence intervals, as would be the case for regression or stochastic frontier analysis.

TFP analysis

TFP analysis involves the use of index numbers to produce measures of productivity. In simple terms, a TFP index is defined as the ratio of the quantity of outputs produced to inputs used. Most firms use a diverse range of inputs to produce multiple output, so the indexing approach combines these into a single measure of output and input quantity.

TFP indexes are the most commonly used approach to measuring productivity for firms, industries and the economy.

The most common indexing approach used in productivity studies is the Törnqvist index which weights inputs using cost shares and outputs using revenue shares. The Törnqvist index can be used to measure productivity growth for a single firm over time, or the relative productivity levels of a number of firms at a single point in time.

However, multilateral TFP indexes can also be used on panel data to measure TFP levels between firms and growth rates over time. The multilateral TFP index that is most commonly used is an adjusted Törnqvist index as defined by Caves, Christensen and Diewert.[1]

Calculating TFP has a greater informational requirement than DEA, as both price and quantity data is required. This often presents particular challenges when estimating capital inputs. However, TFP is much more computationally simple and hence reproducible than the other techniques discussed here.

Like DEA, TFP indexes are non-parametric and therefore do not produce statistical information about significance or confidence intervals.

Stochastic Frontier Analysis

Stochastic Frontier Analysis (SFA) is an econometric approach to productivity estimation, which like DEA:

- constructs a production frontier using methods that are similar to regression (but more complex); and
- only requires data on input and output quantities to measure efficiency.

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[1] Caves, D.W, Christensen, L.R. and Diewert, W.E. (1982), 'Multilateral Comparisons of Output, Input, and Productivity Using Superlative Index Numbers', *Economic Journal*, 92(365): 73-86.

The main advantage of SFA is that being an econometric approach, it accommodates data 'noise' (eg. errors in data or omitted variables) and statistical tests can be performed to test the significance of variables specified in the model.

Although technical efficiency is measured as the distance between an observation and the frontier, SFA recognises that not all the difference between a firm's costs and the efficient frontier may be due to inefficiency.

SFA has previously been used to measure the efficiency of the NSW electricity distributors as part of the 2000 distribution price review.

Econometric cost functions

Estimation of econometric cost functions is a common approach used to determine efficient costs. Like SFA, this approach incorporates the desirable statistical properties including the ability to test the significance of variables. An additional desirable feature is the ability to include environmental variables directly in the model specification.

However, less desirable features of cost function estimation are:

- depending on the model specification, this approach can be quite data intensive;
- as there are a number of different functional forms that may be used to estimate cost functions, this can make the studies using this approach difficult to replicate and comparisons between studies more difficult; and
- firms' costs are compared to the sample average, rather than best performance (as with a frontier estimation approach).

Partial measures

The discussion above reviewed the common approaches used to estimate comprehensive measures of productivity and efficiency. These measures provide the best information about overall economic performance of a firm. However, it is also common for regulators to estimate partial productivity indicators (which compare a single input and output) as these are much more easily calculated. This section highlights the limitations of partial measures by way of a simplified example.

Assume that there are two companies that use two inputs – labour and water mains – to produce one output – gigalitres of water delivered to customers. The quantities of each of the inputs used by each of these two companies to provide a gigalitre of water to a customer are set out in Table 1.

Table 1: Inputs used to deliver one gigalitre of water

Company	Employees	Mains (km)
Company A	10	2
Company B	5	4

Traditional partial performance indicators would involve dividing the output by each of the inputs to show the performance measures set out in Table 2.

Table 2: Partial performance indicators

Company	GL/Employees	GL/Mains (km)
Company A	0.1	0.5
Company B	0.2	0.25

The question is which company is more efficient, and why? Is Company B more efficient because it requires half as many employees to deliver the same volume of water to customers than Company A? Or is Company A more efficient because it requires only half the quantity of mains to deliver the same quantity of water to customers than Company B? Unfortunately it is not immediately obvious which company is more efficient.

Therefore partial measures cannot provide insight into a firm's overall efficiency and may provide a misleading picture of performance if viewed in isolation.

Review of performance measurement approaches by regulators

Sydney Water has commissioned two studies of its economic performance that have used comprehensive benchmarking techniques including DEA and TFP analysis. The detailed results of these studies are discussed below.

Regulators in Australia and overseas (including the Tribunal) have made extensive use of these same techniques (ie. DEA, TFP, SFA and econometric cost functions) to measure the performance of regulated firms. Table 3 provides a summary of the use of these benchmarking techniques in the context of price reviews.

Table 3: Regulatory productivity studies

Regulator	Price review	Study
Ofwat (UK)	Water and Sewerage 2004	Ofwat commissioned a range of studies to examine aspects of economic performance which included TFP analysis to examine the scope for future efficiency gains and econometric cost models used to examine efficient operating and capital cost levels.
Commerce Commission (NZ)	Electricity Transmission/ Electricity Distribution 2004	Calculated Fisher TFP indexes using data from 1996 to 2002 to measure productivity for the transmission and distribution sectors. Used multilateral TFP indexes and econometric cost functions to assess productivity levels of the 29 distributors.
Office of the Regulatory General (VIC)	Electricity Distribution 2001	Benchmarking study to assess efficient operating and maintenance costs.
The Tribunal (NSW)	Gas Distribution (AGL) 1999/2000	A range of benchmarking techniques used to assess efficiency of gas distributors using data from Australian and US firms. Benchmarking techniques used included regression analysis to assess cost drivers, DEA, SFA and corrected ordinary least squares.
Queensland Competition Authority (QLD)	Electricity Distribution 2000	Estimation of an econometric cost function to determine relative efficiency of QLD electricity distributors' costs relative to US investor owned distributors.

Office of Energy Regulation (DTe) (Netherlands)	Electricity Distribution 2000	DEA models used to examine relative efficiency levels and to set individual X factors for each distributor. DTe has signalled its intention to use DEA and/or TFP to determine a generic X factor to apply to all firms at the next price review (applying yardstick regulation).
The Tribunal (NSW)	Electricity Distribution 1999	Study benchmarked efficiency levels using DEA and SFA. Included a sample of firms from Australia, NZ, the USA and England and Wales. Productivity change measured using Malmquist DEA and TFP.
Queensland Electricity Reform Unit (QLD)	Electricity Transmission/ Electricity Distribution 1997	DEA study using a database of Australian, UK and US firms.
Productivity Commission and Bureau of Industry Economics (Aust)	Ongoing research into performance of economic infrastructure industries	International benchmarking studies have been produced for the electricity, telecommunications and waterfront sectors (among others) that calculate partial and comprehensive benchmarks (eg. using TFP analysis).
The Tribunal (NSW)	Electricity Distribution 1994	Study used TFP and DEA to examine efficiency levels and productivity growth of NSW metropolitan distributors against a database of Australian, UK and US firms.

Other countries that have used comprehensive benchmarking studies to examine productivity in the context of electricity price reviews include:[2]

- Denmark (DEA);
- Finland (DEA);
- England and Wales (DEA, TFP and econometric analysis);
- Northern Ireland (DEA and econometric analysis);
- Norway (DEA); and
- Sweden (DEA and SFA).

DETAILED RESULTS OF CEPA AND FE STUDIES

CEPA analysis

Professor Tim Coelli from the Centre for Efficiency and Productivity Analysis (CEPA) undertook a study commissioned by Sydney Water (in cooperation with the Water Services Association of Australia (WSAA)) and used a range of comprehensive benchmarking techniques to assess performance including:

- DEA: a linear programming approach that estimates an efficient frontier based on the observed performance of the firms in the sample. This produced measures of the relative efficiency of the firms in the study at a single point in time;

[2] Jamasb, T. and Pollitt, M. (2001), *Benchmarking and Regulation of Electricity Transmission and Distribution Utilities: Lessons from International Experience*, December, DEA Working Paper No. 0101.

- Malmquist DEA: this is an extension of DEA that is used to measure productivity change among the sample of water firms over time. This approach also identifies the elements of productivity change including the shift in the efficient frontier (technical change), the movement of the firm in relation to the efficient frontier (technical efficiency change) and scale efficiency change; and
- Törnqvist TFP: this is an alternative approach to measuring productivity change over time among the sample firms. Rather than using a linear programming approach, this technique uses an index number approach where inputs are weighted according to their relative cost and outputs are weighted according to their revenue shares.

This study is perhaps the most up-to-date and comprehensive performance review of Australian water and wastewater services and has provided Sydney Water with valuable insights into the level and sources of the company's economic efficiency.

The CEPA study was undertaken in two stages. The first stage, undertaken in 2001, focussed on water supply activities only. The second stage of the study updated this analysis (in 2002) and expanded the analysis to include both water supply and wastewater activities. The following reports on the results of the second stage analysis as it is the most comprehensive and up-to-date available.

Relative efficiency

DEA was used to measure the efficiency levels of a sample of 49 firms including:

- 18 WSAA firms;
- 11 additional firms from Queensland;
- 10 additional firms from Victoria; and
- 10 firms from the United Kingdom.

The DEA analysis used publicly available data from the 1998/99 financial year, which was adjusted to ensure comparability across the dataset.

DEA produces efficiency scores between zero and one. A score of one (or 100 per cent) means that the firm is technically efficient (compared to the other firms measured) and is on the production frontier.[3] A score of 0.7 or 70 per cent indicates that the firm could produce the same outputs with 30 per cent less inputs (disregarding any operational constraints it may face in achieving this). The DEA scores reported in Table 4 are shown in percentage form (ie. as 100 per cent, 70 per cent, etc).

The DEA results for water supply, wastewater and water supply and wastewater combined are shown in the table below. For each DEA model, Table 4 shows two efficiency 'scores' as follows:

- **TE or technical efficiency:** this is the most relevant score which reflects the efficiency gains that are possible assuming that a firm is unable to change its scale of operation (which is clearly true in the short to medium term); and
- **TE-CRS or technical efficiency assuming constant returns to scale:** this score shows the efficiency gains that are possible if a firm is able to alter its scale of operation.

[3] The production frontier shows that maximum output that can be produced using a given amount of input and hence represents the best practice performance amongst the sample of firms.

Table 4 : DEA model structure and results

Water supply				
VSOC[2] model specification		**VSOC model results**		
Outputs	**Inputs**		**TE**	**TE-CRS**
Volume supplied (ML)	Operating costs ($'000)	**Sydney Water**	100%	77.4% (drs)[1]
Number of services ('000)	Capital costs ($'000)	WSAA mean	87%	82.2%
VSOM[2] model specification		**VSOM model results**		
Outputs	**Inputs**		**TE**	**TE-CRS**
Volume supplied (ML)	Operating costs ($'000)	**Sydney Water**	100%	88.2% (drs)
Number of services ('000)	Total km of mains (km)	WSAA mean	76.2%	73%
Wastewater				
VSOC model specification		**VSOC model results**		
Outputs	**Inputs**		**TE**	**TE-CRS**
Volume collected (ML)	Operating costs ($'000)	**Sydney Water**	100%	74.4% (drs)
Number of services ('000)	Capital costs ($'000)	WSAA mean	88.3%	77.8%
VSOM model specification including UK firms		**VSOM model results including UK firms**		
Outputs	**Inputs**		**TE**	**TE-CRS**
Volume collected (ML)	Operating costs ($'000)	**Sydney Water**	86.4%	80.4% (drs)
Number of services ('000)	Total km of mains (km)	WSAA mean	74.6%	71.3%

VSOM model specification excluding UK firms

Outputs	Inputs
Volume collected (ML)	Operating costs ($'000)
Number of services ('000)	Total km of mains (km)

VSOM model results excluding UK firms

	TE	TE-CRS
Sydney Water	100%	82.2% (drs)
WSAA mean	82.6%	79%

Water supply and wastewater (aggregated)

VSVSOC[2] model specification

Outputs	Inputs
Water supply volume supplied (ML)	Water supply opex + wastewater opex ($'000)
Water supply services connected ('000)	Water supply capex + wastewater capex ($'000)
Wastewater volume collected (ML)	
Wastewater services connected ('000)	

VSVSOC model results

	TE	TE-CRS
Sydney Water	100%	87.4% (drs)
WSAA mean	93.5%	87.4%

VSVSOM[2] model specification

Outputs	Inputs
Water supply volume supplied (ML)	Water supply opex + wastewater opex ($'000)
Water supply services connected ('000)	Water supply mains + wastewater mains (km)
Wastewater volume collected (ML)	
Wastewater services connected ('000)	

VSVSOM model results

	TE	TE-CRS
Sydney Water	100%	92% (drs)
WSAA mean	84.7%	82.5%

Notes:

1. drs refers to decreasing returns to scale. This means that Sydney Water is operating above optimal scale.

2. The model name, ie. VSOC or VSOM, is formed by the first letter of each output and input specified in the model. For example, the water supply VSOC model = ***Volume*** *(of water supplied) +* ***Services*** *(number of services) +* ***Opex*** *+* ***Capex****, and the water supply VSOM model =* ***Volume*** *(of water supplied) +* ***Services*** *(number of services) +* ***Opex*** *+* ***Mains****.*

The key results from the CEPA DEA analysis are as follows:

- Sydney Water is fully technically efficient (ie. it has a DEA score of 100 per cent) in all models except the wastewater model where the inputs are specified as operating expenditure and kilometres of mains (as a proxy for the quantity of capital inputs), where Sydney Water's DEA score is 86.4 per cent (suggested a possible reduction in input usage of 13.6 per cent);
- Professor Coelli's report suggests that the wastewater model, which specifies a physical measure of capital, unfairly penalises the WSAA firms (including Sydney Water) in comparison to the UK firms included in the analysis. This is because the UK firms have newer assets and hence are likely to have lower maintenance requirements;
- the wastewater model excluding the UK firms resulted in Sydney Water achieving a DEA score of 100 per cent; and
- all of the models that measure technical efficiency assuming constant returns to scale (the TE-CRS scores), show that Sydney Water is operating above optimal scale, which is outside the control of Sydney Water.

Productivity growth

As well as producing measures of the relative efficiency levels of the water utilities, the CEPA study measured productivity growth among the sample of firms over the period from 1995/96 to 2000/01. As described above, productivity change was measured using two different techniques, Malmquist DEA (which is an extension of standard DEA analysis) and Törnqvist TFP (which is an index number approach).

As with the technical efficiency scores, productivity growth was measured for water supply, wastewater and aggregated water supply and wastewater activities.

The table below shows the measured productivity growth for Sydney Water and the mean productivity growth among the sample of WSAA firms per annum over the period 1995/96 to 2000/01.

Table 5: Average productivity growth per annum 1995/96 to 2000/01

Malmquist DEA[1]		**Törnqvist TFP**	
Water supply			
Sydney Water	2%	Sydney Water	1%
WSAA mean	0.9%	WSAA mean	0.6%
Wastewater			
Sydney Water	0.9%	Sydney Water	2.6%
WSAA mean	1.5%	WSAA mean	0.6%
Water supply and wastewater (aggregated)			
Sydney Water	1.4%	Sydney Water	1.5%
WSAA mean	0.9%	WSAA mean	0.7%

Note:

1. The productivity analysis is based on the VSOM model specification.

The results of the productivity analysis show that Sydney Water achieved productivity growth that exceeded the WSAA mean growth in virtually all cases.

Frontier Economics TFP analysis

In 2004, Frontier Economics assessed Sydney Water's productivity over time using Törnqvist TFP. The study measures productivity performance for the firm as a whole over the 11 year period from 1992/93 to 2003/04. The data used for the study was collected directly from Sydney Water.

TFP model

The TFP model incorporates the following outputs produced by and inputs used by Sydney Water:

- **outputs**: the model uses customer numbers as the measure of output. The number of customers is considered to be the best indicator of the service level provided by Sydney Water as it is required to connect all customers and provide sufficient network capacity to meet their needs. The model combines the water, wastewater and stormwater customer numbers into a single measure of output quantity using the revenue shares of these activities as the weights; and
- **inputs**: the model incorporates all major inputs used by Sydney Water to provide water, wastewater and stormwater services. This includes labour (including capitalised labour), capital, plant operation contractor costs, energy costs, chemical costs, works and services contractor costs, equipment hire, licence fees and other miscellaneous expenses. These input quantities are weighted by their relative share of total costs to form a single measure of input quantity.

The other major output produced by Sydney Water that must be reflected in the TFP model is the quality of service provided. Achieving mandatory standards in water, wastewater and stormwater services drives significant capital expenditure and Sydney Water's performance against those standards have improved over the study period. There are a number of ways in which quality improvements could be accounted for in the TFP model including specifying quality as an output or adjusting outputs or inputs to reflect quality outcomes. This study takes a conservative adjustment approach that only adjusts capital inputs for changes in quality outcomes.[4]

The TFP analysis adjusts capital inputs for the following quality outcomes:

- water quality: percentage of water tests where there were *no coliforms* present; and
- wastewater quality:
  - kilograms of suspended solids per megalitre of effluent discharged to ocean outfalls; and
  - kilograms of nitrogen and phosphorus per megalitre of effluent discharged by inland treatment plants.

TFP results

The level and movement in Sydney Water's total factor productivity is presented in Figure 1. It shows the TFP series for:

- Sydney Water: quality adjusted TFP series;
- electricity, gas and water utilities as measured by the Productivity Commission; and

[4] This is more conservative than adjusting outputs, as adjusting outputs would be equivalent to adjusting *all* inputs rather than just capital inputs.

- the Australian economy wide, as measured by the Australian Bureau of Statistics.

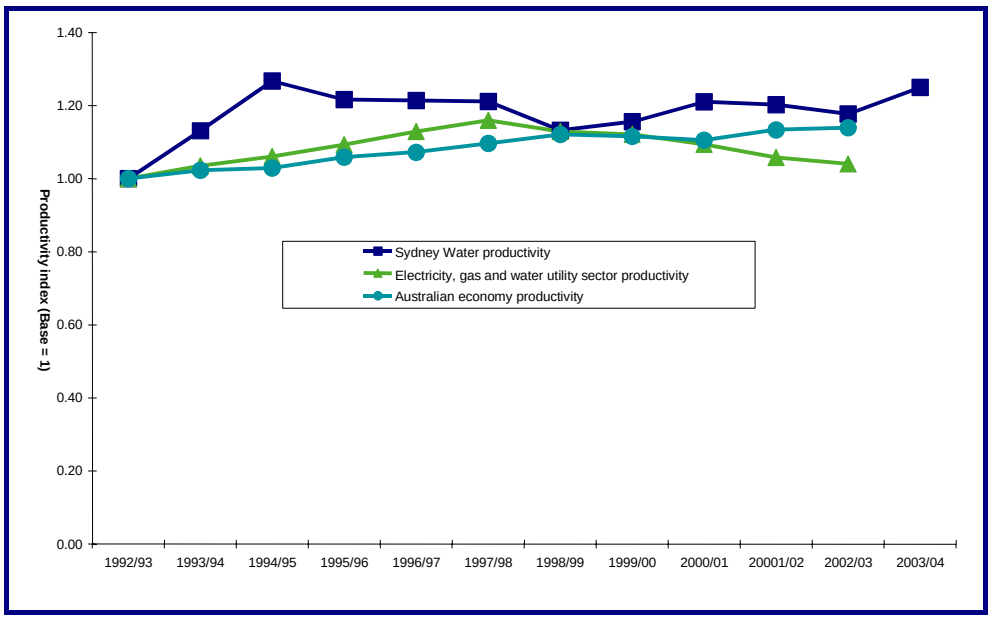

Figure 1: Sydney Water, utility sector and Australian economy wide TFP growth 1992/93 to 2003/04

From 1992/93 through to 1996/97 Sydney Water embarked on a significant productivity improvement program. This ambitious program delivered significant productivity gains from 1992/93 to 1994/95 with a 25 per cent improvement in overall productivity due to significant reductions in workforce and expenditure.

Measured in isolation, productivity in subsequent years, 1994/95 to 1998/99, appears to fall away as expenditure on the delivery of Sydney Water's services was steadily increased. From 1998/99 Sydney Water's productivity rose slightly to 2000/01, fell off again over the next two years and then rises steeply from 2002/03 to 2003/04. The level of productivity in 2003/04 is the highest it has been since 1995/96.

The recent improvement in productivity in the quality adjusted series is largely due to the improvement in the quality of service, which effectively reduces the quantity of capital used to provide services. In addition, the labour force continues to decline, almost consistently over the series. This improvement in productivity is reinforced by a reduction in almost all input categories.

In conclusion, while there has been some variation in productivity levels over the study period, Sydney Water has experienced periods of substantial productivity growth, including from 2002/03 to 2003/04. In addition, as shown in the submission Sydney Water has achieved higher and more consistent productivity growth than the electricity, gas and water utility sectors and the Australian economy as a whole.

Appendix B – Matters raised by the Tribunal

Sydney Water has made significant progress against matters raised for further development by the Tribunal. This section provides an overview of progress on the following matters:

- refining service quality indicators;
- understanding Sydney Water's economic level of leakage;
- establishing a consistent definition for multiple dwelling buildings;
- determining the costs and impediments to tenant billing;
- identify the full cost and options for providing Blue Mountains septic pump-out services; and
- identifying and applying the preferred methodology for minor service extension methodology.

REFINE SERVICE QUALITY INDICATORS

Sydney Water currently has system performance standards and environmental indicators specified in the Operating Licence. For the current licence review the Tribunal has finalised the system performance indicators, with work still being completed on the customer and environmental indicators, as discussed below.

Sydney Water strongly supports the application of service quality indicators to monitoring its performance. Not only does performance monitoring provide the mechanism by which Sydney Water is held accountable for the quality of services we provide to customers, monitoring service outcomes also provides valuable input into internal decision making processes. Sydney Water uses the information obtained from the monitoring of service standards to assist in expenditure decisions that are driven by the objective of minimising the costs of meeting service standards over the long-term.

Service quality and system performance indicators

An inter-agency reference group was formed to consider and advise on the appropriate set of indicators. Following recommendations from the reference group the Tribunal Secretariat drafted a set of indicators and definitions that were reviewed for their robustness.

The Tribunal finalised the system performance indicators for Sydney Water, the SCA, Hunter Water and Wyong & Gosford Councils in July 2004. The information gathered from the new service quality and system performance indicators will be used for both licensing and pricing purposes.

The Special Information Return (SIR), to be completed in each price submission year, will include forward projections of these indicators for the next price path. The Tribunal will use both actual and projections of these indicators to assess future prices.

The proposed indicators include:

- Water quality:
  - percentage of water tests that meet the Australian Drinking Water Quality guidelines for system performance monitoring and for indicator organisms; and

- number of water quality complaints per 1,000 water properties in a reporting period.

- Water Interruption:
  - frequency and duration of interruptions;
  - repeat interruptions;
  - frequency of mains breaks;
  - losses from the water system; and
  - response time to breaks.
- Water pressure:
  - frequency of pressure problems; and
  - repeat events.
- Sewerage service:
  - frequency of overflows and properties affected;
  - repeat overflows;
  - response times;
  - restoration time; and
  - frequency of breaks/chokes.

Environmental indicators

The Tribunal has also conducted a review of Sydney Water's environmental indicators. The final draft version of the proposed indicators has been released.[5] Sydney Water is generally supportive of the indicators proposed in the final draft. However, there are a number of indicators that Sydney Water does not support, these being financial indicators for demand management and recycling and a stormwater indicator relating to stream restoration.

Sydney Water has proposed that the Catchment Management Authorities should become the body responsible for the coordination of management decisions regarding the Botany Wetlands, and that Sydney Water's management would be undertaken through the certified Environment Management System (EMS). As such the requirement regarding Botany Wetlands should be taken out of the Sydney Water's Operating Licence.

Customer indicators

The Tribunal carried out a review of customer service indicators. A report on customer indicators was provided to Sydney Water for comment in July 2004. Sydney Water is generally supportive of the recommendations made[6] in the report. However, Sydney Water has raised concern about the appropriateness of certain indicators and the ability to collect data in relation to some specific indicators suggested.

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5 GHD, *Independent Pricing and Regulatory Tribunal Review of Sydney Water Corporation Environmental and ESD indicators, Final Report*, August 2004.

6 Harford Enterprises Pty Ltd, *Report to Independent Pricing and Regulatory Tribunal, Customer Service Indicators and Reporting on localised system performance for Sydney Water Corporation, Draft Report*, July 2004.

ECONOMIC LEVEL OF LEAKAGE

Sydney Water has undertaken two major projects that have increased both the understanding of the actual leakage level from Sydney Water's water supply network and the current estimate of the most economic level of leakage in the context of Sydney Water's operating environment. These projects are:

- **Global Water Balance:** a major review of Sydney Water's water balance calculation, from which leakage (real losses) estimates are derived, was undertaken during 2004. The subsequent estimation of Sydney Water's real loss performance following the process detailed in the report, shows a decrease in real losses from 10.7 per cent (approximately 188 ML/d) of total 2002/03 supply to 9.3 per cent (approximately 143 ML/d) of total 2003/04 supply. Sydney Water engaged an independent auditor to validate the 2003/04 Water Balance and leakage results. This audit found that Sydney Water's processes for estimation are robust and reliable. The review also indicates that Sydney Water's methodology is in accordance with, or better than, industry practice. Notwithstanding the improved leakage results in 2003/04 it is important to note that there is a widely held understanding within the water industry that an error margin of plus or minus 2 per cent can be applied to water balance calculations. This may significantly influence leakage results from year to year.
- **Economic Level of Leakage (ELL):** the first formalised examination of the leakage/cost relationship or the economic level of leakage for Sydney Water has recently been completed. Sydney Water has followed the process detailed in the best practice report published by the UK Water Industry regulator OFWAT in 2002 titled 'The Tripartite Report'. Following the process described in the OFWAT report, costs used in the examination of Sydney Water's economic level of leakage consist of operating costs only (scanning and repairs) and exclude one-off capital expenditures. The economic level of leakage results for Sydney Water are initial estimates based on the best information available at this time and a process of ongoing refinement will need to be followed for some period before the level of confidence in the results is such that definitive conclusions can be reached.

Sydney Water's initial estimate of its economic level of leakage provides a range of values based on various assumptions around several key inputs to the calculations. The identified economic level of leakage values range from 118.7 ML/d up to 145.3 ML/d at the current marginal cost of water of 18c/kL.

Sydney Water does not consider that the current marginal cost of 18c/kL adequately reflects the scarcity value of water that is likely to be identified by the Tribunal as part of its consideration of the wholesale price of water to reflect the Metropolitan Water Plan. Sydney Water considers that a marginal cost of water of 38c/kL more accurately reflects a shift towards the current scarcity value of water in the absence of clear guidance from the Tribunal and subject to review

. This estimate of the marginal cost of water is consistent with:

- the recovery of the SCA's full revenue requirement as a variable charge; plus
- an allowance of 7c/kL for Sydney Water's BOO filtration expenses.

At a marginal cost of water of 38c/kL the identified economic level of leakage values range from 93.3 ML/day up to 116 ML/day. For the purposes of modelling programs of work that would be required to achieve these leakage levels and the subsequent investment requirements, Sydney Water has used the mid-point of these values. At a marginal cost of 38c/kL this is estimated to be 105 ML/day.

Sydney Water considers that it is feasible to reduce leakage from the current 143 ML/day in 2003/04 to the identified mid-point value for the economic level of leakage

range (based on a marginal cost of 38c/kL) of approximately 105 ML/day by expanding current operational activities and progressively implementing additional operating and capital programs. These programs would include:

- the implementation of an extensive flow-monitoring program to better identify the areas of higher leakage. This would also improve the effectiveness of existing detection activities and allow an accurate determination of background leakage, the rate at which leakage returns to an area and the validation of leakage gains;
- an expanded program of leakage scanning and repair;
- the implementation of an extensive Pressure Management Program to reduce leakage by both reducing the likelihood and severity of leakage in an area; and
- continued improvement to information systems that support the identification of the most appropriate areas for action.

The implementation of these expanded programs would represent a significant increase in the level of investment required for leakage reduction activities over those currently in place. It is estimated that the financial impact of implementing these programs would be in the order of $48 million over four years with an ongoing requirement for an additional $5.2 million per annum after that. This represents a net increase in current expenditure of $35 million over the period to 2008/09 years with ongoing operating expenditure double current levels (additional $2.6 million per annum). Due to the considerable investment required, to firstly achieve and then maintain any designated level of leakage performance, a cautionary approach is recommended when considering leakage target setting. Leakage target setting for Sydney Water should be considered in the context of:

- Sydney Water Corporation's existing Leakage Reduction Program, which has been in place since 1999. This is a comparatively short period when compared with overseas programs, particularly those in the UK. As a result there remains a level of uncertainty in areas fundamental to estimation of optimal leakage performance;
- the understanding within the water industry that an error margin of plus or minus 2 per cent can be applied to Global Water Balance calculations;
- the economic evaluation of performance such as that undertaken as part of Sydney Water's determination of its economic level of leakage. While this study has assisted greatly in Sydney Water's understanding of its current leakage performance and the leakage cost/benefit relationship, it is clear that there is a need to continue to further refine these estimates as improvement is made to many of the underlying data inputs; and
- the broader Sydney Water Demand Management Program.

Sydney Water considers that a quantitative volumetric target, such as reducing leakage to 105 ML/d, would not be the most appropriate form of leakage target at this stage given the level of uncertainty in many areas of leakage cost/benefit estimation. Alternative indicators such as those that focus on key leakage reduction and other related activities might provide a more meaningful view of Sydney Water's performance in the area of leakage management.

Indicators based on the successful completion of negotiated programs of work, periodic reviews/refinement of studies such as the ELL study and subsequent annual reviews of the leakage indicators will provide improvements to both leakage understanding and performance.

MULTIPLE DWELLING BUILDINGS

Multiple dwelling buildings, with the exception of single storey or townhouse style dwellings, typically have a single water meter for the whole building. Sydney Water currently bills the body corporate for water usage. The body corporate then apportions the water usage charge over each of the units. Sydney Water has reviewed Hunter Water's method of charging in view of establishing a consistent definition. Hunter Water charges on a different basis to Sydney Water. Hunter Water apportions the water usage to each unit on the basis of allocating common meter usage across all units equally or by unit entitlement.

As part of this review it was identified that there may be water savings if each unit in a residential multiple dwelling building receive an apportioned water usage account. This method of charging was subsequently assessed through the Demand Management Least Cost Planning process. The assessment, based on evidence from other Australian water providers, showed that there were potential water savings.

Sydney Water intends to consider this method of apportioned billing in its suite of demand management initiatives. If this initiative progresses then there will be a consistent definition for a customer charge in a multiple dwelling building, between Sydney Water and Hunter Water Corporation.

DETERMINE COSTS AND IMPEDIMENTS TO TENANT BILLINGS AND ASSOCIATED ISSUES

In late 2003, Sydney Water prepared a discussion paper on the costs, key drivers and impediments to implementing direct billing for tenants and this was distributed to some key stakeholders for discussion.

Sydney Water's investigation into tenant billing identified that there are more cost effective demand management programs to reduce consumption than tenant billing. This is based on the premise that the introduction of tenant billing is only likely to send a price signal to 85,000 *additional* customers. This represents approximately 6 per cent of all residential properties. Sydney Water is considering a suite of other demand management initiatives to increase the number of customers receiving a pricing demand signal.

To determine the effectiveness of tenant billing as a demand management initiative, tenant billing was compared against current and planned demand management programs using the least cost planning model. The least cost planning model analyses cost to implement and maintain demand management programs against estimated consumption savings.

When considered in this way tenant billing was a less cost effective demand management initiative than other current and planned demand management programs, such as BASIX (Building and Sustainability Index), leakage reduction, landscape assessment and pressure reduction. One of the reasons tenant billing does not rank well is that it incurs both cost and lost revenue each and every year.

Although there are approximately 425,000 tenanted residential properties in Sydney Water's area of operation, not all tenanted properties will receive a price signal under a tenant billing model. Only individually metered properties are eligible for tenant billing, and approximately 225,000 (53 per cent) tenant properties are not individually metered. Of the 200,000 individually metered tenant properties, an estimated 115,000 are currently already responsible for their water usage charges as part of their leasing arrangement. The remaining 85,000 individually metered tenant properties do not receive a demand management signal via receipt of a Sydney

Water account. This means that the introduction of tenant billing is only likely to send a price signal to 85,000 additional customers.

Furthermore, Sydney Water believes that there are more cost effective demand management programs to reduce consumption than tenant billing. For example, Sydney Water has reached agreement with the NSW Department of Housing to retrofit properties with water efficient devices. Sydney Water will fund an initial retrofit program, with the NSW Department of Housing funding further retrofits from savings in water costs. Sydney Water has been conducting further analysis on interstate and international data to draw a link between the receipt of a price signal and a reduction in water consumption.

Sydney Water is likely to introduce the following initiatives to increase the number of customers receiving a pricing demand signal:

- modifying Sydney Water's metering policy to ensure all new multi-dwelling properties have separate unit metering. This initiative would progressively increase the percentage of individually metered properties receiving a Sydney Water account; and
- educating and raising awareness amongst property owners and managing agents that they have the option to pass on water usage charges at individually metered properties.

In addition Sydney Water is exploring apportioning common meter usage charges for residential multiple dwelling buildings over each unit, resulting in each unit receiving a Sydney Water account for their notional proportion of the complex's consumption.

IDENTIFY FULL COSTS AND OPTIONS FOR PROVIDING BLUE MOUNTAINS SEPTIC PUMP-OUT SERVICES

Sydney Water conducted an investigation into the full costs associated with providing a subsidised pump-out service to Blue Mountains customers.

The costs of delivering the pump-out service equated to $1.2 million in 2002. This included a $1.13 million cost paid directly to the contractor for pump-out services and approximately $80,000 in Sydney Water costs to administer and manage the scheme. These costs are recovered in the form of regulated revenue from the customer and a Community Service Obligation (CSO) of $660,000, equating to an average annual subsidy of around $1,000 per property.

The Blue Mountains pump-out scheme currently subsidises approximately 680 properties. Of the total, 115 properties currently have sewerage services available through the Priority Sewerage Program (PSP) over the next five years.

As part of its 2005 Submission Sydney Water seeks to:

- retain the Blue Mountains septic pump-out scheme's current cost recovery arrangements for properties that do not have sewerage services available for the next price path period;
- restructure the regulated two-tiered usage tariff system to reduce the number of illegal sewage discharges;
- increase the financial incentives to connect for customers who have sewerage services available; and
- establish a subsidised connections program for pump-out customers, particularly for those in hardship.

IDENTIFY APPLICATION AND PREFERRED METHODOLOGY FOR MINOR SERVICE EXTENSION METHODOLOGY

In late 2003, Sydney Water developed a policy on connections for the provision of water and sewer services, which included minor service extension policy and procedures. Since March 2004 Sydney Water has implemented its 'Customer Service Policy, Connection: Provision of Water and Sewer Services'. As part of this Price Review Sydney Water will be providing to the Tribunal a report containing the following information:

- number of applications received per year;
- number of applications completed per year, and total lots served;
- total capital cost per year;
- total cost contributed by initial applicants; and
- total cost contributed initially by Sydney Water.

The e-Developer system is being used to record details of minor extensions.

As at 30 June 2004, 10 applications have been completed. There have been two customer enquiries in relation to Sydney Water's application of the policy. Sydney Water does not intend to request any changes for the next pricing period.

Appendix C – Expenditure uncertainties

While the determination of appropriate levels of renewals, reliability and business efficiency expenditures are largely within the control of Sydney Water to define, there are three key areas of the capital program that are less certain due to potential changes in the operating environment. These uncertainties also have implications for operating expenditure on a forward looking basis. These are:

- **growth related investments:** in particular the timing and scale of growth in new urban sectors and the impact of BASIX on growth in both infill and greenfield sites; and
- **overflow abatement investments:** those costs associated with expected mandatory standards to support environmental improvements associated with dry and wet weather overflows from the sewerage system.

The uncertainties related to these investments are discussed in more detail below.

GROWTH

Over the last five years Sydney has experienced its strongest sustained period of growth since the 1960s. Current population projections from the Department of Infrastructure, Planning and Natural Resources (DIPNR) indicate that this growth will continue with the population of Sydney forecast to increase from its present level of about 4.1 million to 4.5 million by about 2011. This forecast increase in growth together with a continuing decline in average household size creates a demand in Sydney for an additional 125,000 dwellings in the period 2005/06 to 2008/09.

Based on DIPNR's forecast for the following 30 years it is expected that approximately 705,000 new dwellings will be developed in Sydney Water's area of operation. Based on the Government's metropolitan growth policy position, an estimated 70 per cent of new dwellings are likely to be developed in the existing urban areas and the remaining 30 per cent in new release areas. Because of the dwindling supply of broadacre land available in release areas DIPNR estimates that about 150,000 of the new dwellings will need to be developed in new release areas located in the southwest and northwest sectors of Sydney. Sydney Water is working as part of a whole-of-government planning process (coordinated by DIPNR) to determine the sequence and timing of the release of the land to facilitate the efficient roll-out of water-related infrastructure across the sectors. While the requirements of all infrastructure providers, including Sydney Water, will be taken into account in the decision making process, the dynamic nature of planning and population change means that the eventual sequencing and timing of land releases may change.

Once the sequencing and timing is finalised and approved by the Government, firmer estimates of the servicing requirements and associated costs can be made.

Whilst development in established areas will generally utilise existing Sydney Water infrastructure, significant new infrastructure will still be required to allow for the full development potential of these areas to be realised. The projected capital expenditure for growth for areas covered by existing Development Servicing Plans (DSPs) is forecast to be approximately $647 million over the four year price path (2005/06 to 2008/09), with major amplifications scheduled for Penrith, Hoxton Park, Warriewood and the Illawarra.

With the introduction of BASIX some of these areas are suitable for the introduction of recycled water schemes. These are currently in the planning stage and will be incorporated into the next review of DSPs.

The total capital expenditure necessary to service development in the southwest and northwest sectors of Sydney has been projected to cost approximately $1.5 billion. The final quantum of these costs will be influenced by the timing and development sequence adopted by DIPNR and approved by the Government.

Based on preliminary development estimates, Sydney Water has allowed an average of approximately $57.5 million for infrastructure that will need to be constructed every year over the next four years to service the early release areas within the southwest and northwest sectors. Annual costs could vary substantially from $20 million per year to over $120 million per year depending on the timing and staging of releases.

On this basis, approximately 25 per cent of the proposed growth expenditure from 2006/07 is subject to significant uncertainty.

Table 6: Projected growth capital expenditure 2005/06 to 2008/09

Expenditure $million (2004/05 dollars)	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**Total**
Established areas	171.3	198.7	196.1	80.9	**647.0**
SW/NW sectors	17.0	57.5	57.5	57.5	**189.5**
Total	**188.3**	**256.2**	**253.6**	**138.4**	**836.5**

In addition to the uncertainty regarding the sequencing and timing of development in these areas, there are significant environmental constraints which will require large scale recycling schemes to be incorporated into the preferred servicing strategies. These will:

- enable customers to reduce potable water consumption to meet Government's BASIX criteria for a 40 per cent reduction in water consumption; and
- provide wastewater systems that maintain the quality of the Hawkesbury-Nepean River to meet Department of Environment and Conservation (DEC) standards for effluent discharge.

Servicing growth will have significant implications for Sydney Water's capital investment program, especially in the southwest and northwest sectors where infrastructure provision is likely to require large upfront and lumpy investments.

Accordingly, Sydney Water is investigating a range of alternative funding strategies which will provide the Corporation with a suite of potential financing models to service growth in the southwest and northwest sectors whilst minimising the impact on Sydney Water's financial position.

To summarise, the main uncertainties associated with growth investments are:

- the location and rate of development within the proposed new urban sectors;
- the impact of BASIX on servicing options and costs; and
- the funding options adopted for these areas.

OVERFLOW ABATEMENT

Significant gains have been made in the recent past on reducing the impacts of discharges of effluent from sewage treatment plants to the environment.

Specific targets for dry and wet weather overflow abatement have been set in Sydney Water's Environment Protection Licences up to 2005. The initial priority for the program has been to improve the system performance in dry weather for sewage pumping stations, improve wet weather performance in the Blue Mountains and completion of the Interim Infiltration/Exfiltration Sewerfix (small pipes) Program.

Overflow abatement requirements to be set by DEC for 2005/06 to 2009/10 as part of the longer-term overflow abatement objectives remains a significant driver of capital investment. DEC has indicated an intention to set 2010 targets for the majority of sewerage systems as a reflection of progress towards the 2021 target for each system including the four large systems at Malabar, North Head, Bondi and Cronulla. Sydney Water has determined that effectively meeting longer-term objectives for wet weather overflows may require rehabilitation of Sydney Water's sewers and potentially private house sewer lines, followed by sizing and construction of amplification and storage at various points in the system.

In developing an appropriate staging of works for these four large systems it is important to demonstrate the cost/benefit achieved following each stage towards longer-term objectives. Staging should be such that subsequent investments build on each other towards the long-term objectives in an affordable manner.

This staging approach requires resolution with Government and DEC as to the robustness of the current uniform long-term overflow objective as compared to a graduated overflow objective within each system relative to the environmental and recreational amenity value at various points within each system. Following the confirmation of the objectives and the relative contribution of house sewer line rehabilitation as part of the most efficient works to meet the overflow objectives, the house sewer line rehabilitation (including possible quantum and funding) can be considered in addition to investment by Sydney Water in its system.

Sydney Water, in consultation with DEC, intends presenting an integrated strategy for Government consideration in 2005. As outlined below, Sydney Water's proposed investments during the period to 2008/09 remain valid irrespective of this uncertainty around long-term objectives, the relative benefit of rehabilitation of house sewers and funding of the same.

In addition to the above discussion other uncertainties surrounding the required program include:

- the practical application of the licence requirement that there is no deterioration in system performance;
- the appropriateness of setting 2010 targets for the Illawarra system at this stage, where significant capital programs are underway and the outcomes are not yet verifiable;
- DEC's intention to set sewer choke frequency targets and limits from 2010;
- Sydney Water's acceptance of the regulatory risk associated with a requirement for zero dry weather overflows from sewage pumping stations; and
- the need to address the existing Diamond Bay/Vaucluse outfalls ahead of addressing the longer-term wet weather overflow issues in the Bondi system.

Taking into account these uncertainties, Sydney Water is currently proposing $168 million in capital expenditure from 2005/06 to 2008/09 to progress the overflow abatement program towards its long-term goals. This includes:

- $12 million for sewerage catchment modelling from 2005/06 to 2006/07;
- $35 million for targeted 'hotspots' 2005/06 to 2007/08;
- $18 million in 2008/09 for amplification, storage and rehabilitation of Sydney Water's sewers in Bombo, Shellharbour and Warriewood systems to meet a 2010 DEC target of 48 overflows per 10 years;
- $5 million in 2006/07 for storage and amplification in the Blackheath system to meet a current licence pollution reduction program for 10 overflows in 10 years; and
- $98 million for wet weather overflow abatement in the four large systems from 2007/08 to 2008/09.

Sydney Water and DEC are close to resolution on most aspects of the DEC's requirements for dry weather overflow abatement and this component is not seen as a major driver of capital investment over the period. If dry weather overflows are experienced at sewage pumping stations Sydney Water will be required to determine whether expenditure is justified to reduce the risk of future overflows.

The long-term investment required for wet weather overflow abatement has a greater level of uncertainty due to the difficulties in validating long-term objectives and the impact of these on the staging of works. In particular, the staging of works for the four large wastewater systems towards any longer-term objectives could vary the timing and quantum of investment. The four large systems are each significantly above the long-term objectives for wet weather overflows as articulated in the Sewer Overflow Licensing EIS. Sydney Water has estimated the investment required to achieve this long-term objective in the four large systems is in excess of $2.3 billion.

Both Sydney Water and DEC recognise the need for achieving cost effective outcomes for these four large systems and are actively exploring mechanisms to measure staged improvements towards a longer-term overflow objective. An alternative graduated approach to the articulation of the long-term overflow objectives as noted above is being considered by Sydney Water for discussion with DEC as part of an integrated strategy for submission to Government in 2005.

Under either long-term option (current uniform 40 overflows in 10 years across each system and graduated overflow targets within systems) the $98 million investment planned within the period to 2008/09 would focus on works that are consistent with the overall least cost solution. This may involve either rehabilitation of Sydney Water's sewers and a portion of house sewers in the leakiest sub-system or construction of amplification and storage to address chronic overflow points in the systems. Modelling used to demonstrate such amplification is consistent with meeting a range of longer-term objectives (that is, it would need to be done in any case).

Sydney Water considers that construction market constraints preclude accelerating the program. Depending on the outcome of the other uncertainties costs could increase by as much as $95 million to 2008/09 for works associated with transferring flows from Diamond Bay/Vaucluse to Bondi Sewage Treatment Plant (STP) and meeting a 2010 overflow target of 48 in 10 years for the Illawarra from 2010.

The funding for any house sewer rehabilitation that may be necessary as part of a least cost solution towards the longer-term overflow objectives is subject to policy consideration as part of an integrated strategy to be presented to Government in 2005. If Sydney Water is required to fund house sewer rehabilitation this could increase operational costs up to approximately $50 million per annum from 2007/08 for an estimated four year period ($200 million in total).

House sewer lines

Sydney Water has an interest in the condition of its customers' house sewers due to the inherent connection they have with Sydney Water's system. House sewerage networks have a finite design life and require periodic repair and maintenance. However, due to the fact that they are located underground, rarely present customers with an acute problem and in many instances extend beyond the property boundary, many property owners are unwilling or unable to accept their responsibilities, or are unaware of their responsibilities, in this regard. Sydney Water's investigations indicate that a proportion of house sewer lines are defective and contribute to wet weather overflows.

The appropriate mix of works to achieve reductions in local wet weather overflows depends on the local abatement objectives. This may involve the concurrent rehabilitation of Sydney Water's system and a proportion of house sewers and may also involve localised amplification and storage in Sydney Water's system.

There are significant uncertainties surrounding the costs and benefits of widespread house sewer rehabilitation. Sydney Water is undertaking further analysis of its Sewerfix program carried out between 1997 and 2003 to validate the outcomes of works undertaken including the significance of rehabilitating house sewer lines in reducing wet weather overflows.

This analysis will also consider alternatives to private sewer rehabilitation in achieving wet weather overflow abatement outcomes, and develop more accurate risk based estimates of the overall cost to achieve reductions in wet weather overflows.

As noted above Sydney Water proposes to take a comprehensive position to Government in 2005 addressing the long-term objectives for overflow abatement and the contribution of rehabilitating house sewer lines as part of the least cost staging of works. This will facilitate any policy decision that may be required in relation to funding rehabilitation of house sewers.

Appendix D – Stormwater

STORMWATER

Sydney Water has responsibility to provide stormwater services in the Sydney region. However, there are a number of specific challenges associated with the provision of stormwater services:

- the ownership and control of stormwater assets is highly fragmented; and
- much of Sydney Water's stormwater assets were built more than 50 years ago, and some are over 100 years old resulting in some performance issues.

Changes are underway to improve the overall management of stormwater services in the context of the introduction of Catchment Management Authorities. Sydney Water supports these initiatives as providing the basis for a more integrated approach to catchment and stormwater management.

Sydney Water's stormwater operations and assets

Sydney Water provides water and sewerage services to greater Sydney, the Illawarra and the Blue Mountains. It also provides limited stormwater services within parts of the Sydney Basin through the ownership of some 436 kilometres of stormwater channels and drains. It is estimated that these facilities represent less than 2 per cent of Sydney's stormwater network.

Sydney Water also has 3 drainage pumping stations, 37 pollution control devices, 12 retention basins, 3 pollution control ponds and 2 wetlands (including Botany Wetlands). A further 21 pollution control devices will be installed in 2005/06 under the Stormwater Environmental Improvement Program (SEIP). These assets interact with the drainage assets of 31 out of 41 councils in the Sydney metropolitan area, draining an area of 28,000 hectares, across 17 stormwater catchments, covering approximately 450,000 properties.

A large proportion of the stormwater system outside of the Rouse Hill area (a new growth area) is over 100 years old (see Figure 1) with some assets of significant heritage value such as Alexandra Canal, Drainage Pumping Station 1 (Marrickville) and the Tank Stream. In addition there are still some 11 kilometres of combined sewers in the city.

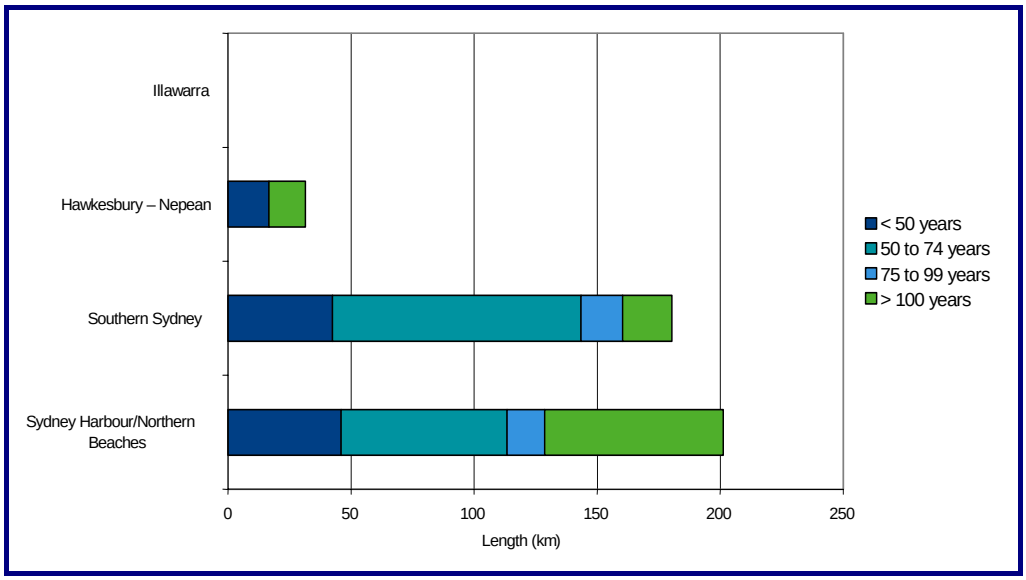

Figure 2: Stormwater asset age

Inspection programs are carried out to assess the structural integrity of conduits, identify obstructions in closed conduits, and allow for a capital works renewal program to be developed. Based on inspection data collected to date, 84 per cent of stormwater assets are in good condition and 16 per cent are in fair condition. Nevertheless, Sydney Water's aging stormwater asset base means increasing renewals and maintenance costs.

It is widely recognised that the ownership and management of stormwater assets across the Sydney metropolitan area is highly fragmented. Sydney Water owns less than 2 per cent of Sydney's stormwater network and levies charges across 27 per cent of the properties charged by Sydney Water.

Sydney Water's obligations

Sydney Water's responsibilities are outlined in its Operating Licence (2000) and the *Sydney Water Act 1994*. The Act requires Sydney Water to provide, operate, manage and maintain a stormwater drainage system within the capacity of the stormwater drainage transferred from the Water Board to Sydney Water as at the date of transfer. In short, Sydney Water's responsibility is to maintain the hydraulic capacity of its stormwater assets.

Institutional arrangements

Introduction of Catchment Management Authorities

In October 2003, the Premier announced a reform of the NSW Government's approach to natural resource management. As part of this reform, 13 Catchment Management Authorities (CMAs), with a responsible and accountable board, are intended to replace the former Catchment Management Trusts and Catchment Management Boards. The 12 regional CMAs were launched in January 2004. The process to establish the Sydney Metropolitan CMA has recently commenced and DIPNR is currently preparing a proposal for Government consideration.

It is intended that the Sydney Metropolitan CMA will lead and coordinate efforts to deliver catchment based solutions for natural resource management such as bushland rehabilitation, water quality improvements, sediment control and community education. The CMA will also take an interest in stormwater issues. At this stage it

appears that the Sydney Metropolitan CMA will not seek an operator role with regards to stormwater, but rather the Sydney Metropolitan CMA will work to coordinate activities across local government boundaries and agency jurisdictions.

Additional funding for stormwater projects could be supplied from councils under a separate proposal from DEC as discussed below.

The Urban Stormwater Program

The NSW Government's Waterways Package, released in May 1997, highlighted the need for a whole-of-government approach to urban stormwater management and reducing waterway pollution. As a result, the State-wide Urban Stormwater Program was devised and contained three elements:

- a Stormwater Trust grants scheme;
- an urban stormwater education program; and
- a requirement for local councils to prepare stormwater management plans for urban areas.

The Stormwater Trust grants scheme chaired by DEC has, since 1998, funded an $82 million staged program to build local councils' stormwater management capacity and improve waterway health. The program ceased at the end of June 2004.

DEC has been developing a draft paper for Government's consideration that proposes a continuation of the Urban Stormwater Program that would provide local councils across NSW the option of raising additional stormwater management charges per residential property for stormwater improvement initiatives.

DEC also proposes that there be a voluntary rationalisation of Sydney Water's stormwater assets through a yet to be agreed asset transfer process to councils.

Sydney Water's approach

Sydney Water will continue to manage its stormwater portfolio along the following lines:

- **assets**: continued investment in the condition assessment and priority renewals programs;
- **operations**: continued cleaning and maintenance of assets, whilst seeking improved efficiencies as more assets are acquired through the SEIP program;
- **funding**: pursue a position of commercial sustainability for Sydney Water's stormwater business by the containment of overheads and accommodation of appropriate pricing structures and prices to support the business; and
- **communication**: consistently communicate Sydney Water's role, especially in the current institutional environment, as one of maintaining the condition and hydraulic capacity of its stormwater assets.

Pricing structure

The Tribunal has indicated that its intention is to not review the appropriate level and mechanisms for funding stormwater costs until the current government reviews have been resolved. The Tribunal is also concerned that low levels of expenditure on stormwater assets by water agencies have been the result of the uncertainty in the way the proposed institutional arrangements for stormwater in the Sydney Basin will be implemented.

Sydney Water remains committed to providing stormwater services that meet statutory obligations. Sydney Water is also committed to the implementation of catchment based solutions to stormwater rather than the current ad hoc approach.

Sydney Water accepts the removal of property based charging for stormwater services as of 1 July 2004, and notes that this is in accordance with the Council of Australian Governments (COAG) principles. However, it should be noted that as a consequence Sydney Water's stormwater revenue base has been reduced from $19 million in 2000/01 to a forecast of $13.7 million in 2004/05, whilst its cost base has remained static. The declining revenue base, and the possibility of greater responsibilities for management of stormwater, is a key challenge for Sydney Water which needs to be addressed in this Price Review.

Appendix E – Trade waste charges

Trade waste charges are cost reflective and transparent and determined according to the principle that the 'polluter pays'. Trade waste charges provide customers with a clear indication of the costs associated with acceptance, transport and treatment of waste products, and these charges provide an incentive for customers to reduce discharges or invest in on-site wastewater treatment.

Sydney Water's pricing policies also provide an important incentive for industry to invest in effluent improvement programs. Customers who implement effluent improvement programs may qualify for the waiving of any critical substance charges and also qualify for discounts on certain other quality charges. The rationale for these price adjustments is to reduce the overall discharge load on the system by working with industry to find solutions to lowering effluent concentrations.

This submission seeks only minor alterations to the current pricing strategy and is designed to complement recent changes to the *Trade Waste Policy*. These changes are consistent with Sydney Water's objectives in providing a trade waste acceptance service, and in particular have been designed to support the corporation's long-term objectives in promoting water conservation and cleaner production alternatives for business customers.

The trade waste pricing principles are in line with the guidelines contained within the National Water Quality Management Strategy, 1994 (Guidelines for Sewerage Systems, Acceptance of Trade Waste), and the principles determined by the Trade Waste Charges Working Group set up by NSW Treasury in 1994 and outlined in its final report of 1997. The proposed changes contained within this submission are also consistent with these principles.

PRICING PRINCIPLES APPLIED IN TRADE WASTE MANAGEMENT

In this submission, no attempt has been made to comprehensively review the costs associated with the trade waste program or of the impacts of trade waste substances, as such a review would be extremely complex and costly compared to the benefit gained. Costs were last comprehensively reviewed for the 2000 pricing submission and an allowance has been made to account for increasing sewerage transport and treatment costs, and a component has been allocated for IT and research and development expenditure.

SCHEDULE OF CHARGES[7]

There are three categories of charges that relate to trade waste services:

- **administrative charges:** these charges relate to the costs (principally labour costs) involved in generating and maintaining discharge agreements;
- **quality charges:** There are two types of standard quality charges – domestic which are a combination of cost recovery and incentive-based charges, and non-domestic – which are primarily incentive-based. The former charges vary for each chargeable substance and reflect the costs of accepting and treating specific waste products. Biochemical Oxygen Demand (BOD) and sulfate charges vary as

[7] All trade waste charges in the tables in this Appendix are dependent on the application of Sydney Water's *Trade Waste Policy* and management plan, and instruments within that policy may influence customers' overall charges.

the concentration of each substance in the discharge increases, reflecting increases in costs associated with treatment and harm to Sydney Water's system. The latter, non-domestic incentive based charges are triggered when the effluent levels exceed acceptance standards; and

- **critical substance charges:** these quality charges are established as multiples of the specific quality charges and are used to set a price signal to limit loads of specific substances in the system.

Administration charges

The current system of charging industrial customers according to the costs involved in generating and maintaining agreements has not been altered, and charges remain as for the current pricing period, except for CPI movement and slight changes to inspection fees. Customers who have entered on-line monitoring and direct reporting programs continue to be offered discounts on agreement fees. These discounts have been simplified to a straight percentage reduction. These discounts were previously available only to high risk customers in risk indices 1-4, however, these discounts have been extended to all industrial customers.

The current schedule of administration fees covering the processing of applications and maintenance of agreements is based on the costs associated with accepting pollutants of known characteristics and impacts. Occasionally, requests are received to discharge pollutants where no formal assessment has yet been made of the impacts associated with accepting these pollutants to sewer or the costs involved in maintaining such agreements. To accommodate applications of this type and to maintain subsequent agreements, it is proposed that application and agreement fees to discharge pollutants not currently in the *Trade Waste Policy* be directly negotiable with the applicant, and be determined by the costs involved. In this way, the higher costs involved in assessing and maintaining these agreements are not cross-subsidised by the remaining customer base. The application fee would be calculated at a standard hourly rate of $105 and charged in arrears. The costs associated with maintaining agreements could also be higher than standard, especially where acceptance of the pollutant requires sophisticated and frequent analyses to be carried out. The agreement fee would be calculated using a standard hourly rate of $105 plus analytical costs incurred. A quality charge for the substance would be determined by the acceptance standard and be negotiated with the customer.

Income from trade waste administrative charges in 2003/04 amounted to $2.5 million, and is not expected to change significantly over the pricing period. A breakdown of the revenue from administration charges is shown in Table 1, together with estimates for the pricing period 2005 to 2007.

Table 7: Revenue and projections – administration fees 2003/04 to 2006/07

2004/05 dollars	2003/04 actual	2004/05 projected	2005/06 projected	2006/07 projected
Commercial fees				
Agreement	$1.19 million	$1.19 million	$1.19 million	$1.19 million
Inspection	$4,493	$4,500	$4,500	$4,500
Industrial fees				
Application	$20,412	$20,000	$20,000	$20,000
Agreement	$1.35 million	$1.35 million	$1.35 million	$1.35 million

Variations	$8,277	$8,300	$8,300	$8,300
Inspection	$9,395	$9,400	$9,400	$9,400
Total	**$2.50 million**	**$2.50 million**	**$2.50 million**	**$2.50 million**

Quality charges

Domestic substances

This submission seeks to maintain charges at current levels for all domestic substances, and introduces a new chargeable substance, total dissolved solids (TDS). A domestic equivalent concentration of 450 miligrams per litre for TDS, and a pricing strategy designed to recover costs and promote effluent reuse and cleaner production is proposed.

The reuse of sewage treatment plant effluents for irrigation or industrial/commercial uses is increasing, particularly in response to pressures to reduce the demand on potable supplies. Effluent for these purposes is often limited by high TDS concentrations, which are not removed by normal sewage treatment processes.

The strategy covers several reuse scenarios and the impact on TDS charging is as follows:

- **systems discharging to the ocean, with no reuse or other limitation**: under this scenario, a new charge of $0.005/kg will be applied, with an acceptance standard set at 10,000 mg/L, and penalty charges (2x) liable in excess of this;
- **systems discharging to inland or ocean, with reuse or discharge limitation**: this scenario will be managed according to the critical substance methodology. Maximum acceptable industrial loadings (MAILs) will be calculated for each such system based on the limiting concentration for the effluent. A charge of $0.005/kg will apply and be subject to penalty charges on exceeding the acceptance standard (determined by the Manager, CICS) and critical substance charges when the total agreed or discharged masses in the system reach a factor of the MAIL, according to critical substance charging methodology; and
- **systems where treatment to remove TDS is applied**: in this scenario a sewage treatment plant discharging to ocean or inland waters diverts part of that effluent to an advanced water reclamation plant providing users with high quality treated effluent. In these cases a contract may be signed with the end-user to cover capital and on going costs, however, the marginal cost needs to be passed on to customers discharging significant levels of TDS. A nominal rate of $0.15/kg of TDS treated by the reclamation plant has been determined based on the typical treatment costs involved. The actual charge to be applied in each catchment will vary according to the fraction of total flow treated for reuse and that fraction is applied to the nominal rate to determine the actual rate. In summary the charge is calculated as:

  Actual Charging Rate = $0.15/kg x fraction of Average Dry Weather Flow (ADWF) treated

Non-domestic substances

In this submission quality charges for non-domestic substances continue to be charged on the basis of providing a financial incentive related to the acceptance standard for the substance. The only proposed change to the manner in which these charges are applied is outlined below.

In its previous submission for pricing for 2003/04 and 2004/05, Sydney Water sought flexibility in the introduction of new substances and subsequent charges, which was approved by the Tribunal. Substances would be introduced initially with a provisional standard, without charge, allowing both Sydney Water and customers an opportunity to assess the impact of the standard. In line with this approval, Sydney Water introduced a provisional standard at 1 January 2004 for non-ionic surfactants, and contacted all affected customers with the reasons for its introduction. Non-ionic surfactants became a chargeable pollutant at 1 July 2004 with a threat level of 3 and a subsequent charging rate of $0.0614/kg. No changes are sought in the manner in which this scheme operates and Sydney Water will continue to notify the Tribunal of any new standards or changes to existing standards.

Critical substance charges

Critical substance charges continue to be used to limit the amount of substances accepted into specific sewage catchments that are nearing or exceeding their acceptable capacities to transport, treat or dispose of those substances. The *Trade Waste Policy* allows for renegotiation of long-term average daily mass (LTADM) at the time of agreement renewal where necessary to further reduce the loads of these substances. No changes to the current critical substance charging methodology (with the exception of concessions outlined in the following section) are proposed in this submission.

Table 8: Revenue and projections – quality charges 2003/04 to 2006/07

$million (2004/05 dollars)	**2003/04 actual**	**2004/05 projected**	**2005/06 projected**	**2006/07 projected**
Industrial quality charges-standard	$6.17	$6.39	$5.90	$5.62
Industrial quality charges-penalty	$1.60	$1.60	$1.50	$1.48
Critical substance charges	$0.44	$0.44	$0.41	$0.38
Commercial quality charges	$2.92	$2.92	$2.92	$2.92
Total	**$11.13**	**$11.35**	**$10.73**	**$10.40**

Charge reductions for customers entering effluent improvement programs

Incentive charges are an effective means of encouraging compliance with the *Trade Waste Policy*, however, customers are occasionally doubly penalised by paying the charges at the same time as they are required by the *Trade Waste Policy* to upgrade or implement trade waste pre-treatment facilities. This can have the effect of diverting funds away from where they offer most benefit, that is, the improvement of trade waste quality through investment in capital and technology.

Discount on quality charges

Customers who implement water conservation measures may experience increases in effluent concentrations due to water savings even though discharge masses remain constant or decrease, and this can have the effect of increasing BOD charging rates and incurring the penalty charge on other substances. This proposal seeks to offer customers a concession on quality charges if, as a result of implementing a water conservation program approved by Sydney Water (such as the *Every Drop Counts Business Program*), concentrations increase and the customer subsequently agrees to implement an effluent improvement program (EIP) to meet

the standard whilst reducing the overall load. The discount would apply for the course of the agreed EIP and customers would pay for BOD and sulfate at a fixed rate, based on the average concentration during the 12 months preceding the water conservation measures. For other substances, excluding those with discrete acceptance standards, the penalty charge would be waived if the acceptance standard is breached as a result of water savings. If a customer defaults on a milestone in the EIP, Sydney Water would have the option of reinstating the full charges.

Discount on critical substance charges

This proposal seeks to waive the critical substance charges for customers who contribute significant loads and commit to and abide by an EIP addressing the critical substance. In this way, customers are able to divert their resources and expenditure towards reducing the impact of their discharge on the problem, expenditure that may otherwise have been directed to the additional charges. As this proposal is targeted at those customers who have the most significant impact, it represents the most cost efficient and fair method of fixing the root cause of the problem, that is, elevated loads of substances discharged into the affected system.

Commercial quality charging codes

No changes to the current system of applying set charging codes to commercial sectors are proposed, with the exception of normal movement in CPI.

Other charges

No changes to *Wastesafe* greasy waste treatment charges are proposed, except for normal movement in CPI. The standard charge for product assessment remains unchanged, however, the hourly rate for additional time needed to finalise assessment is changed from $66.70 per hour to $105 per hour ($52.50 minimum increment) to align with other professional rates across Sydney Water. Sale of trade waste data has similarly increased from $66.70 per hour to $105 per hour. These changes will have an insignificant impact on customer's charges.

Financial implications of all proposed changes

Sydney Water currently receives approximately $20 million from all trade waste charges per year, and this amount is not expected to significantly change over the years 2005/06 and 2006/07. The forecasted changes to revenue and costs to 2006/07 is shown in Table 9.

Table 9: Trade waste revenue, expenditure and projections 2003/04 to 2006/07

$million (2004/05 dollars)	**2003/04 actual**	**2004/05 projected**	**2005/06 projected**	**2006/07 projected**
Trade waste expenditure				
Administration costs	$5.50	$5.49	$5.49	$5.49
Treatment costs	$3.50	$3.50	$3.50	$3.50
Transport costs	$3.50	$3.50	$3.50	$3.50
Wastesafe payments to depots	$5.50	$5.50	$5.50	$5.50
Wastesafe operation and admin	$0.85	$0.89	$0.89	$0.89

$million (2004/05 dollars)	2003/04 actual	2004/05 projected	2005/06 projected	2006/07 projected
operation and admin costs				
IT and R&D costs	$1.00	$1.00	$1.00	$1.00
Total expenditure	*$19.85*	*$19.88*	*$19.88*	*$19.88*
Trade waste revenue				
Administration fees	$2.50	$2.85	$2.50	$2.50
Quality charges – industrial	$7.78	$7.99	$7.40	$7.10
Quality charges – commercial	$2.92	$2.92	$2.92	$2.92
Critical substance charges	$0.44	$0.44	$0.41	$0.38
Wastesafe revenue	$6.87	$6.87	$6.87	$6.87
Total revenue	*$20.51*	*$21.07*	*$20.10*	*$19.77*
Difference	$0.66	$1.19	$0.22	-$0.11

Impacts of Total Dissolved Solids charging

The proposed charge of $0.005/kg of TDS, applied in catchments without advanced treatment, will generate approximately $125,000 in revenue in 2005/06. To model the impact of the charge on customers' bills, 12 months of TDS results and other data was used and applied to the trade waste bill that would have been generated over that period. The results show that for medium to large sized customers, that is, those paying trade waste charges of greater than $5,000 a year (these customers combined contribute above 90 per cent of total trade waste revenue), only one customer will experience an increase in their annual trade waste bill of more than 50 per cent (63 per cent). The majority of customers will experience increases of less than 5 per cent of their annual trade waste bill.

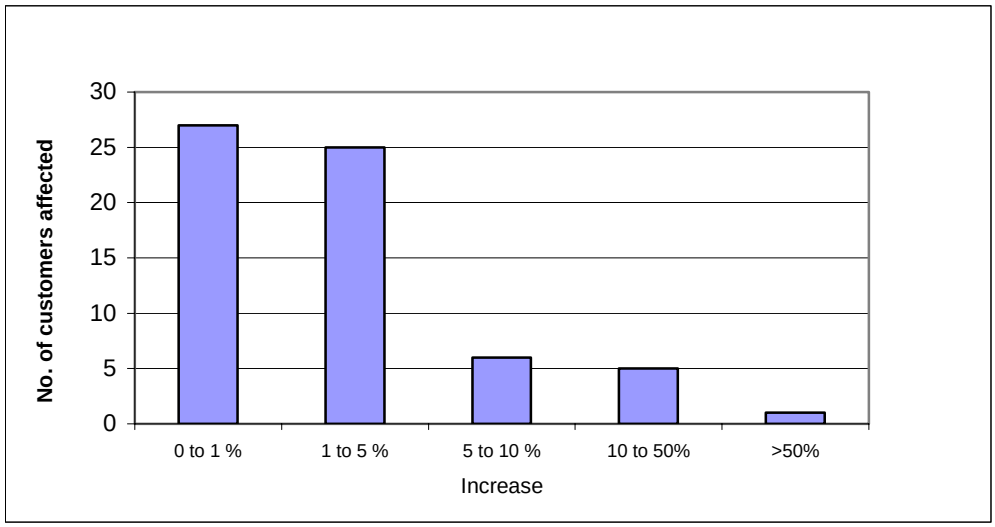

Figure 3: Increase in trade waste charges due to standard TDS charge 2003/04 to 2006/07

The proposed charge for TDS in catchments with advanced treatment to remove TDS is calculated based on standard treatment costs, factored by the proportion of flow that the facility will treat. This pricing scheme has been introduced in order to address the Illawarra Wastewater Strategy, which will include a 20 ML/day reverse osmosis (RO) plant serving BlueScope Steel using Wollongong Sewage Treatment Plant effluent, and as such, the standard pricing and customer impacts have been modelled in this catchment.

The standard price of $0.06/kg of TDS was derived from the anticipated operating costs of the RO plant of $0.15/kL (delivered, giving a cost of $0.15/kg TDS treated), multiplied by 25/60, which is the proportion of the sewage treatment plant flow that will be treated by the RO plant (25 ML includes the RO reject).

The impact of the TDS charge in the Wollongong catchment was modelled by applying 12 months of TDS and other results to the analogous trade waste bill over the period. The results show that of all customers in that catchment, only three customers will experience increase in their trade waste bill of more than 50 per cent. The majority of customers will experience increases of less than 10 per cent (Figure 4).

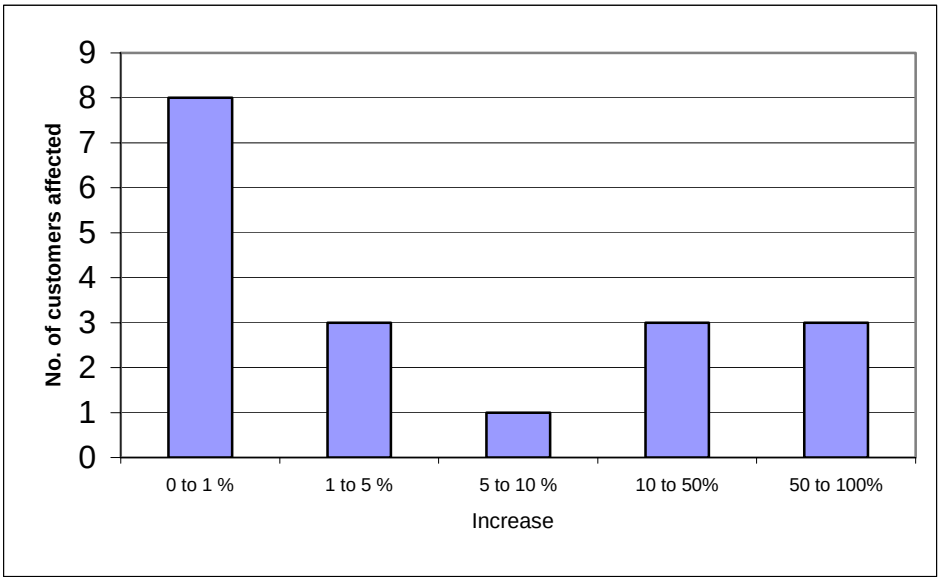

Figure 4: Increase in trade waste charges due to advanced treatment TDS charge 2003/04 to 2006/07

Proposed trade waste charges

The following tables provide a summary of all proposed trade waste charges.

Table 10: Administrative charges

Industrial agreement fees – per quarter								
Risk index	Current				Proposed (to be adjusted by CPI)			
	Standard	With direct electronic reporting (DER)	With on-line monitoring (OLM)	With DER and OLM	Standard	With direct electronic reporting (DER)	With on-line monitoring (OLM)	With DER and OLM
1	$5,270.86	$4,743.77	$4,215.12	$3,688.03	$5,270.86	$4,743.77	$4,216.69	$3,689.60
2	$4,758.01	$4,282.21	$3,702.27	$3,226.47	$4,758.01	$4,282.21	$3,806.41	$3,330.60
3	$2,222.31	$1,999.76	$1,430.50	$1,208.26	$2,222.31	$1,999.76	$1,777.85	$1,555.62
4	$1,253.60	$1,128.24	$461.79	$336.43	$1,253.60	$1,128.24	$1,002.88	$877.52
5	$484.33	$435.89	NA	NA	$484.33	$435.89	$387.47	$339.03
6	$170.93	$153.89	NA	NA	$170.93	$153.89	$136.75	$119.65
7	$113.95	$102.56	NA	NA	$113.95	$102.56	$91.16	$79.76
Hourly rate for processing applications and determining agreement fees where an assessment of pollutant(s) not currently covered in *Trade Waste Policy* is required							$105	
Commercial agreement fees – per quarter								
					Current		Proposed (to be adjusted by CPI)	
First process					$17.09		$17.09	
Each additional process					$5.69		$5.69	
Other charges								
					Current		Proposed (to be adjusted by CPI)	
Wastesafe charges					$0.105 per litre		$0.105 per litre	

Table 11: Acceptance standards and quality charges for domestic substances

Substance	**Acceptance standard (mg/L)**	**Domestic equivalent (mg/L)**	**Charges ($/kg)**	
			Current	**Proposed (to be adjusted by CPI)**
Suspended solids	600	200	0.727	0.727
BOD – to primary STP	*see notes 2 and 3*	230	0.101+[0.0169x (BOD mg/L) / 600]	0.101+[0.0169x (BOD mg/L) / 600]
BOD – to secondary/tertiary STP	*see notes 2 and 3*	230	0.573+[0.0169x (BOD mg/L) / 600]	0.573+[0.0169x (BOD mg/L) / 600]
Grease	Primary 110 Secondary/tertiary 200	50	1.024	1.024
Ammonia (as N)	100	35	1.699	1.699
	150 *see note 4*	50	0.143	0.143
Phosphorus (inland only)	50 *see note 4*	10	1.136	1.136
Sulfate	2,000	50	0.112x[SO_4 mg/L]/2000	0.112x[SO_4 mg/L]/2000
Total dissolved solids (ocean systems, no discharge limitation)	10,000	450	No charge	0.005
Total dissolved solids (inland systems and ocean systems, with discharge limitation)	Determined by system	450	0.01 in specified catchments only	0.005
Total Dissolved Solids (inland and ocean systems, with advanced treatment to remove TDS)	Determined by system	450	No charge	$0.15xfraction of average dry weather flow treated

Notes:

The mass of any substance (with the exception of sulfate) discharged at a concentration which exceeds the nominated acceptance standard will be charged at double the rate for the entire mass for non-domestic substances (including any critical substance charges), and for the mass above domestic equivalent for domestic substances. Concentration is determined by daily composite sampling by either the customer or Sydney Water. Customers who enter into an approved water conservation program may be eligible for flat rate BOD and sulfate charges and will not incur the doubling of the charging rate if certain acceptance standards are exceeded.

The oxygen demand of effluent is specified in terms of BOD_5. Where a reliable correlation can be shown to exist between BOD and another test, Sydney Water may be prepared to accept results based on this alternative test.

Acceptance standards for BOD_5, COD and total dissolved solids are to be determined by the transportation and treatment capacity of the receiving system and the end use of sewage treatment products.

Nitrogen and phosphorus limits do not apply where a sewage treatment plant (to which the customer's sewerage system is connected) discharges directly to the ocean.

Table 12: Threat level based acceptance standards and associated charges for non-domestic substances

Threat level	**Acceptance standard (mg/L)**	**Proposed charge ($/kg) (to be adjusted by CPI)**
0	Provisional	0[3]
1	10,000	$0.0100
2	5,000	$0.0102
3	1,000	$0.0614
4	500	$0.112
5	300	$0.204
6	100	$0.573
7	50	$1.136
8	30	$1.884
9	20	$2.816
10	10	$5.693
11	5	$11.386
12	3	$18.790
13	2	$28.456
14	1	$56.975
15	0.5	$113.960
16	0.1	$569.794
17	0.05	$1,139.640
18	0.03	$1,880.371
19	0.01	$5,697.853
20	0.005	$11,395.696
21	0.0001	*$569,785.036*

Notes:

The mass of any substance discharged at a concentration which exceeds the nominated acceptance standard will be charged at double the rate for the entire mass for non domestic substances (including any critical substance charges), and for the mass above domestic equivalent for domestic substances. Concentration is determined by daily composite sampling by either the customer or Sydney Water. Customers who enter into an approved water conservation program will not incur the doubling of the charging rate for non-complying pollutants.

Sydney Water may introduce charging rates for new substances or revise charging rates for existing substances based on a revision of the risks of accepting the substance and is reflected in the acceptance standard of the substance. The acceptance standard will determine the charging rate of the substance according to the table above.

Substance under investigation

Table 13: Charging codes and charges for commercial customers

Charging code	**Charge ($/kL) (to be adjusted for CPI)**	**Charging code**	**Charge ($/kL) (to be adjusted for CPI)**
A	Deemed $0.00	K	$3.16
B	$0.00	L	$5.28
C	$0.02	M	$7.39
D	$0.05	N	$10.55
E	$0.10	O	$12.66
F	$0.31	P	$15.84
G	$0.53	Q	$21.11
H	$0.73	R	$31.67
I	$1.05	S	$52.78
J	$2.10		
Minimum annual charge (all codes)			$57.34

Notes:

Volumes can be assessed or monitored, ie. the latter based on either a discharge or check meter or a water meter and discharge factor. Assessed volumes may be based on business size, production capacity or an agreed alternative.

Sydney Water can introduce charging rates for new commercial processes, or vary charging rates for existing processes based on an assessment of effluent characteristics from representative businesses. The assessment, based on results from six sampling locations, may be initiated by a customer or Sydney Water.

Table 14: Charges for Critical Substances

Substance status	Charging rate multiplier
Critical	2
Over capacity	3

Notes:

Assessment of the status of substances discharged to sewerage system:

The maximum allowable industrial loading (MAIL) for all sewage treatment plants is assessed using a biosolids and effluent quality model. Wherever the total mass of any substance from all industrial customers within a sewerage catchment, either measured or agreed, exceeds 60 per cent of MAIL it will be regarded as a critical substance for charging purposes. Wherever the total mass exceeds MAIL, it will be regarded as over capacity for charging purposes.

Where a sewerage system, or sub-system, is determined to be affected by significant corrosion related to the discharge of excessive loads of BOD and sulfate, or likely to be affected by such corrosion, the system, or sub-system will be regarded as over-capacity with respect to these substances. The criteria used for determining that a system is likely to be affected by corrosion will be that the average concentration of BOD and/or sulfate are demonstrated by regular composite sampling to be at levels likely to lead to corrosion.

Where a customer agrees to and signs and effluent improvement program related to a critical substance, and maintains milestones within that program, the customer will not incur any critical substance charges.

Charges for critical substances:

Where the measured daily mass of a critical substance discharged by a customer exceeds 1.5 times that customer's long-term average daily mass (LTADM), the charging rate for the component of mass above 1.5 x LTADM is doubled.

Where the measured daily mass of a critical (over capacity) substance discharged by a customer exceeds 1.5 times that LTADM, the charging rate for the component of mass above 1.5 x LTADM is tripled.

Appendix F – Miscellaneous charges including late payment fee

MISCELLANEOUS SERVICES

These miscellaneous services are generally requested by customers when buying and selling properties, building, connecting new plumbing or when developing land.

Since 2001 Sydney Water has embarked on an initiative to improve services to customers and to drive internal efficiencies. These changes have led to a significant lowering in the costs of supply of a number of services, and has allowed Sydney Water to rationalise its service delivery platform, including the closure of a number of service counters.

The reforms involved the establishment of three major delivery channels to allow agencies to provide services to customers. 'Property Link', an electronic service channel for conveyancing products, 'Quick Check' for counter services to plumbers, builders, developers, residential customers and 'e-Developer', an internet based software application that enables developers to lodge Section 73 and other applications to Sydney Water via a licensed Water Servicing Coordinator. An internet link has also been provided via Sydney Water to Property Link agents. This initiative has resulted in significant cost savings and improved services to customers.

As consequence of these agency arrangements the growth in services provided under these arrangements, and the associated reduction in charges, and customer utilisation of the agency services have increased dramatically. This shift in customers to the agents has allowed Sydney Water to continue reforms and rationalisation of service delivery. At present both Sydney Water and the Quick Check service channel provide an over-the-counter service to customers. However, Sydney Water will continue to rationalise these services and the number of Sydney Water counters will therefore continue to decline as a consequence of these process reforms.

Sydney Water applies the fully distributed cost methodology to calculate charges for miscellaneous services. Sydney Water does not include a profit margin in calculating the charges for these services. Miscellaneous charges are calculated according to the following formula:

Miscellaneous charge = base cost + material cost

The base cost includes direct labour costs or direct agency costs, on-costs, transport, equipment and overhead costs for the Customer Service Division and the rest of the Corporation consistent with the approach adopted by the Tribunal in its September 2000 and May 2003 Determinations. The material costs include the cost of materials directly related to the provision of an additional unit of a miscellaneous service.

In 2002/03 and 2003/04 miscellaneous services provided Sydney Water with revenue of $13.5 million in each year.

Sydney Water has undertaken a work-study to determine the resources required to provide specific services. This study has led to a number of adjustments being necessary in order to align charges with true costs. This analysis and the implementation of agency arrangements for service delivery has revealed that Sydney Water has been under-recovering on some of these services. The proposed price changes reflect the necessary price adjustments to ensure that Sydney Water recovers the true cost of providing these services.

MISCELLANEOUS SERVICE REVIEW CRITERIA

The following criteria are considered when assessing miscellaneous services:

Changes to charges

Sydney Water has undertaken a study to determine the resources that are required to provide each service. This study has led to a number of adjustments being necessary to align charges with true costs. As a consequence a number of charges are reduced where work practices and other efficiency savings have reduced costs. In some other cases it will be necessary to increase charges to reflect increases in resource requirements and cost increases. In some cases charges have been amended to correct past errors in estimations that led to an understatement of the true costs of service.

There are a number of charges that have price increases of greater than 8 per cent. The labour costs that flow from the Sydney Water staff Enterprise Agreement of 1 July 2003 equate to an 8 per cent increase. The additional increases are due to:

- the workstudy review identifying that Sydney Water was under-recovering on a number of services;
- the Corporation is not recovering costs on the Full Meter test fee;
- a significant increase in the number of large diagram requests from 1.57 per cent to 4.1 per cent has added to the cost of diagrams;[8]
- costs that were not previously identified as Sydney Water is not currently charging for the Water Disconnection application service;
- trade waste assessment inspections have been aligned to the Technical Service hourly rate to standardise this level of service;
- determining conditions for Building Over/Adjacent to Sewer are proposed to be charged at the Technical Service hourly rate; and
- a greater level of regulation on the Water and Sewer Extension application. This has increased the number of tasks and costs required to process the application.

For services or fees that are new:

- Sydney Water proposes to charge customers who pay late or do not pay their account a Late Payment fee of $5.50 including GST. Sydney Water is proposing to charge the fee in line with other providers as regulated by the Tribunal (see the discussion later in this section on Late Payment fees); and
- where Sydney Water assesses an application for Alternative Water Supplies, it proposes to charge an application fee. This would apply to inspections of bore and grey water connections.

Where existing services are enhanced:

- **Sydney Water supply diagrams in digital format**: a service provided to customers who request large volumes of data that are to be provided in a digital format.
- **Feasibility applications**: a service provided to customers who lodge an application for an indication of potential servicing requirements. This also includes an indication on developer charges for a development proposal.

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[8] Large diagrams require additional recording, printing and handling than standard size diagrams and therefore add additional costs to the standard diagram price.

- **Road closure application**: a service provided to customers who lodge an application for a permanent road closure. Road closure has been identified as not requiring the same level of service as a full Subdivider Developer Certificate therefore Sydney Water is proposing to charge road closure application at the reduced price of $197.00.

Efficiency

Costs of a number of service charges are unchanged. Some services have increased by less than 8 per cent due to efficiency gains or a reduction in the contractual component of the service such as the reconnection service.

There are also a number of discontinued charges where a determination is not required:

- the initial assessments for Product Approvals are now performed by WSAA. Sydney Water is redirecting customers to WSAA. Subsequent involvement by Sydney Water in assessing/approving products is deemed to be core service and no charges to apply; and
- there has been a change to the standpipe hire process. Customers now purchase standpipes directly from standpipe suppliers. They own and maintain the standpipes at their cost therefore there is no requirement for a hire charge or security deposit.

Costs may also change due to products becoming contestable services. During the 2005 Determination period the service of Determining Conditions for Building Over/Adjacent to Sewer to accredited suppliers may become a contestable arrangement.

PROPOSED PRICE CHANGES

Sydney Water proposes that the Tribunal determine the proposed prices in Table 15 for 1 July 2005 to 30 June 2006. For subsequent years within the regulatory period, it is proposed to increase prices based on the increases in Sydney Water's labour costs from the start of the next financial year to which they occur.

Table 15: Proposed miscellaneous charges for 2005/06

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
1	Conveyancing Certificate Statement of outstanding charges.			
	(a) Over the counter	$13.00	$17.50	31,000
	(b) Electronic	$6.50	$7.00	88,100

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
2	Property Sewerage Diagram Up to and including A4 size (where available) Diagram showing the location of the house service line, building and sewer for a property.			
	(a) Certified	N/A	N/A	
	(b) Uncertified			
	(i) Over the counter	$13.50	$20.00	55,400
	(ii) Electronic	$6.50	$10.00	117,200
3	Service Location Print Diagram showing the location of sewer and/or water mains in relation to a property's boundaries.			
	(a) Over the counter	$13.50	$20.00	9,286
	(b) Electronic	$6.50	$10.00	13,324
4	Special Meter Reading Statement	$15.00	$26.00	3,000
5	Billing Record Search Statement – up to and including five years	$28.00	$33.00	200
6	Building Over Sewer/Building Adjacent Sewer letter Statement of Approval Status for existing building over or adjacent to sewer.	$28.00	$29.00	3,400
7	Water reconnection			
	(a) During business hours	$28.00	$30.00	2,800
	(b) After business hours	$123.00	$134.00	400

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
8	Workshop Test of Water Meter Application		(includes 165.00)	
	Plus meter replacement fee			
	20 mm	$165.00	$194.00	
	25 mm	$165.00	$223.00	
	32 mm	$165.00	$247.00	
	40 mm	$165.00	$257.00	
	50 mm	$165.00	$417.00	
	60 mm	$165.00	N/A	
	80 mm	$165.00	$607.00	
	100 mm	N/A	N/A	
	150 mm	N/A	N/A	
9	Water Main Disconnection Application	$30.50	$72.00	–
10	Water Main Connection Application (20 mm and 25 mm) This covers the administration fee only. There will be a separate charge payable to the utility if they also perform the physical connection.	$31.00	$35.00	13,400
11	Water Main Connection Approval Application (32 mm – 65 mm) This covers administration and system capacity as required.	$207.00	$226	1,425
12	Water Main Connection Application (80 mm – Tee and Value) This covers administration and system capacity as required.	$239.00	$246.00	900
13	Application to Assess a Water Main Adjustment	N/A	N/A	

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
14	Standpipe Hire Security Bond	N/A	N/A	
15	Standpipe Hire Annual Fee Quarterly Fee Monthly (or part thereof)	 See Meter Size price schedule N/A N/A	 See Meter Size price schedule N/A N/A	
16	Standpipe Water Usage Fee (All usage)	See Water Usage price schedule	See Water Usage price schedule	
17	Backflow Prevention Device Application and Registration Fee	N/A	N/A	
18	Backflow Prevention Application Device Annual Administration Fee	N/A	N/A	
19	Major Works Inspection Fee	N/A	N/A	
20	Statement of Available Pressure and Flow This fee covers all levels whether modelling is required or not.	$146.00	$160.00	2,300
21	Diagram Discrepancy Application for Sydney Water to undertake an estimation of private sewer lines for a property where no diagram currently exists. Conditions apply.	$107.00	$130.00	160
22	Request for Asset Construction Detailed map of Sydney Water assets indicating water, sewer and drainage.	$56.00	$70.00	150

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
23	Sydney Water Supply System Diagram (a) Large hydra plan showing water, sewer and drainage assets, covering a large area in a single plot. (b) Multiple lots in digital data format.	$12.00 + $105 per hour N/A	$30.00 + $105 per hour $1.00 per lot for water $1.25 per lot for water and sewer Minimum charge $300.00	120 200
24	Building Plan Approval Approval of building/development plans certifying that the proposed construction does not adversely impact on Sydney Water's assets.	$16.50	$23.00	18,750
25	Determining Conditions for Building Over/Adjacent to Sewer Attaching conditional approval requirements to Council approved building/development plans to safeguard Sydney Water's assets.	$79.00	N/A Now contestable	–
26	Water Main adjustment application Application for Sydney Water to investigate the feasibility of relocating an existing water main.	$138.50	$156.00	30
27	Water Main Fitting Adjustment Application Application for an accredited supplier to lower or raise an existing water main fitting.	$89.50	$102.00	50
28	Pump Application (Water) Application for approval of an installation of a pump on domestic or fire service, serving a property.	$119.00	$131.00	110

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
29	Extended Private Service Application Application for Sydney Water to investigate the feasibility of permitting an extended private water service to provide a point of connection.	$84.50	$101.00	50
30	Sewer Junction Connection Application Application for an accredited supplier to insert a junction into Sydney Water's sewer line.	$100.50	$121.00	1,300
31	Sewer Sideline Connection Application Application for an accredited supplier to extend a junction to provide a suitable point of connection.	$100.50	$121.00	700
32	Sewer Main Adjustment Application Application for Sydney Water to investigate the feasibility of relocating or adjusting a sewer main.	$138.50	$157.00	30
33	Ventshaft Adjustment Application Application for Sydney Water to investigate the feasibility of relocating or disusing a sewer vent shaft and an accredited supplier to undertake the work.	$190.50	$213.00	30
34	Disuse of Sewer Application Application for Sydney Water to investigate the feasibility to disuse an existing Sydney Water sewer.	$117.00	$134.00	50
35	Piering Supervision Application Application for Sydney Water to supervise the piering of an existing sewer. The application and work must be carried out by an approved supplier.	$60.50 + $105 per hour	$73.00 + $105 per hour	-

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
36	Concrete Encasement Supervision Application Application for Sydney Water to supervise the encasement of an existing sewer. The application and work must be carried out by an approved supplier.	$ 60.50 + $105 per hour	$73.00 + $105 per hour	150
37 (a)	Plumbing and Drainage Inspection Application Application for Sydney Water to inspect any plumbing and sanitary plumbing and drainage installation. This includes updating the sewerage service diagrams on completion.	$46.50	$59.00	20,900
(b)	Fee per inspection for Sydney Water to inspect any plumbing and sanitary plumbing and drainage installation. NB: Application fee also applies.	$65.00	$72.00	36,000
(c)	Fee per reinspection for Sydney Water to inspect any plumbing and sanitary plumbing and drainage installation. NB: Application fee does not apply.	$65.00	$72.00	4,000
38	Connection to Stormwater Channel Approval Application for approval to connect to Sydney Water's stormwater channel greater than 300 mm.	$242.00	$255.00	80
39	Inspection of Break in Stormwater Channel Application Application for an inspection of a connection to Sydney Water's stormwater channel greater than 300 mm.	$179.50	$204.00	60
40	Inspection of Drainage Lines Application Inspection of drainage lines from stormwater connection to silt arrestor to ensure compliance with AS3500, New South Wales Code of Practice and updating of records.	$96.00	$112.00	80

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
41	Review of Hydraulic Plans Lodge hydraulic drawings to determine if design meets the necessary regulations and Sydney Water's requirements. Water and fire hydraulics to be submitted and examined individually.	$38.00 +$105 per hour	$43.00 +$105 per hour	300
42 (a)	Subdivider/Developer Compliance Certificate (also known as Section 73) Application for a subdivider/developer compliance certificate stating whether a proposed development complies with Section 73 of the Sydney Water Act (1994). In addition, developer charges and various requirements may apply.	$300.50	$325.00	5,400
42 (b)	Feasibility Application Lodgement of an application for an indication of potential servicing requirements. This also includes an indication on developer charges for a development proposal. Formerly included in Subdivider Development Application.	$300.50	$325.00	480
42 (c)	Road Closure Application Lodgement of an application for a permanent road closure. Formerly included in Subdivider Development Application.	$300.50	$197.00	25
43	Developer Investigation Fee Investigation activity in addition to standard application fees.	$80.00 + $105.00 per hour	See Service 42 $105.00 per hour	300

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
44	Design and Construct Contract Administration per Hour Performance of various activities to ensure the quality of the work under contract during the development and to safeguard Sydney Water's assets.	$105.00 per hour	$105.00 per hour	1,800
45	Water and Sewer Extension Application An application seeking an extension of a water or sewer main to a property to make a new connection.	$130.00	$233.00	100
46	Hydrant Resealing Charge levied on the property owner to reseal a fire hydrant to prevent illegal use of unmetered water.	$16.50	$17.00	1,200
47	Product Approval Application	$45.50	No charge	–
48	Dishonoured or Declined Payment Fee Fee for dishonoured reversal/payment processing where a financial institute declined a payment to Sydney Water.	$18.50	$18.20	2,100
49 (a)	Cancellation of plumber's permit – where both parties sign the application.	$0	$0	100
49 (b)	Cancellation of plumber's permit – where only one signature is received.	$39.00	$52.00	100
50	Plumbing and Drainage Quality Assurance Application Application for Sydney Water to provide a Quality Assurance audit role on any plumbing and sanitary plumbing and drainage installation.	$141.50 (did not commence in 2003/04)	$150.00	25,000
51	Technical Services Hourly rate	$105.00 per hour	$105.00 per hour	

No.	Service name	2004/05 price (excluding GST)	Proposed price for 2005/06 (excluding GST)	Volume
52 (a)	Additional Trade Waste Industrial and Commercial Inspections One representative Two representatives Minimum increment	 $66.70 per hour $133.40 per hour $33.35	 $60.00 per hour $120.00 per hour $30.00	
(b)	Trade Waste Application Fee Applies to industrial customers only Variation	$222.00 $267.00	$240.00 $288.00	
(c)	Product Authorisation/Assessment Applies to commercial customers only Application fee Assessment fee	 $200.00 $66.70 per hour	 $216.00 $105.00 per hour	
(d)	Sale of Trade Waste Data	$66.70 per hour	$105.00 per hour	
53	Late Payment Fee	$0	$5.50	
54	Alternative Water Inspection application for Sydney Water to review the proposed connection to an alternative water source, ie. bore water, greywater. This includes updating the sewerage service diagram on completion.	N/A	$210.00	250

LATE PAYMENT FEE

At present, only 41 per cent of Sydney Water customers pay on time. The remaining 59 per cent of customers pay outside of the scheduled 21-day account period. Sydney Water incurs considerable expense in administering the overdue accounts. These costs are ultimately borne by all customers, including those who pay on time.

Sydney Water is proposing to introduce a $5.50 late payment fee inclusive of GST to encourage late-paying customers to pay water bills within the required payment

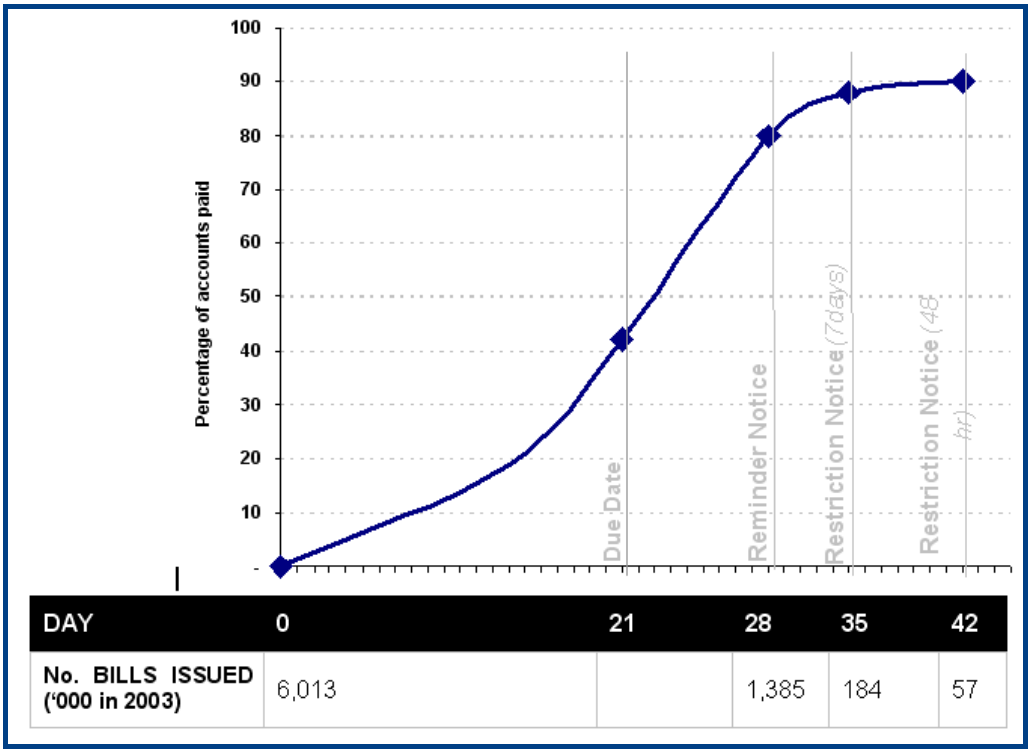
period (21 days after issue). Customers experiencing genuine difficulty paying bills would be protected through a series of exemptions.

The introduction of a late payment fee would encourage customers to pay bills within the account period. Where customers continue to pay their water bills late, the fee would partially compensate Sydney Water for the associated costs. The costs would also be recovered from those customers who generate these costs, rather than be borne by all consumers.

The introduction of a late payment fee would align Sydney Water's credit facilities for overdue accounts with policies adopted in other utilities.

The late payment fee would operate along with existing interest charges and would apply to residential and business customers. Penalties for overdue account balances would be the greater of the late payment fee of $5.50 and interest charges. Late payment fees will be limited to a maximum of one per bill as per Tribunal guidelines.

Figure 5 summarises current customer account payment trends.



DAY	0	21	28	35	42
No. BILLS ISSUED ('000 in 2003)	6,013		1,385	184	57

Figure 5: Customer payment behaviour (2003)

Sydney Water incurs considerable expense in administering overdue accounts. The administrative costs associated with customers who pay late include:

- costs of issuing the 1,385,000 reminder notices each year;
- additional customer contact;
- opportunity costs associated with overdue payment; and
- administering debt collection activities.

The Sydney Water Customer Contract allows for interest or other applicable fees to be charged on overdue account balances. Sydney Water currently charges interest on overdue accounts but does not a charge late payment fee. Of the 875,000 bills that are currently paid late each quarter, interest charges are incurred in 66,200

residential cases. Interest is charged to the customer where the interest on the outstanding amount is greater than $1.00. The average residential interest charge is $2.40 and typically only becomes applicable when the bill is paid at least 20 days late.

The introduction of a late payment fee would align Sydney Water credit facilities for overdue accounts with policies adopted in other utilities. In NSW, the majority of utilities charge a late payment fee. Late payment fee prices, practices and exemptions have recently been standardised for NSW electricity retailers. Reforms to the Energy Retail Code in Victoria now permit electricity and gas retailers to charge a late payment fee under a very similar model to that implemented in NSW. Late payment fees have also existed in the water industry within South Australia for a number of years.

Sydney Water is proposing to adopt the model that governs the application and exemption of late payment fees within the electricity industry. Under the proposal, Sydney Water would charge a late payment fee when it issues the reminder notice that is currently issued seven days after the original account due date. Notification that the late payment fee may be charged if the account is not paid by the due date will be shown on the original notice.

The late payment fee would operate along with existing interest charges, but a customer would only incur either the fee or an interest charge, never both. The fee would apply to residential and business customers. Penalties for overdue account balances would be the greater of the late payment fee of $5.50 and interest charges. Late payment fees will be limited to a maximum of one per bill as per Tribunal guidelines.

Sydney Water will encourage customers who cannot pay their account by the due date to contact Sydney Water to organise alternate payment arrangements. It is proposed that the following customers are to be exempt from the late payment fee:

- residential customers who have entered into an arrangement with Sydney Water for either deferred payment or payment by instalments;
- customers disputing their account through either the Energy and Water Ombudsman NSW or another external dispute resolution body; and
- on a case by case basis as considered appropriate.

Appendix G – Tariff rationalisation

BACKGROUND

Sydney Water provides a range of services to a number of different types of customers in its area of operations. There are currently 80 regulated tariff combinations of which some date back to the inception of the Metropolitan Water Sewerage and Drainage Board in 1888. Since 1990, 45 new tariff combinations have been created in response to changing customer, community and regulator expectations.

This large number of tariff combinations raises a series of problems including:

- Sydney Water customers receiving different service charges for the same level of service;
- the tariff structure does not reflect the current expectations of the community in areas such as improving the water demand management signal;
- prices for a number of services are not cost reflective and as a consequence some customers are receiving significant cross-subsidies that are borne by other customers; and
- significant costs and resources are required to maintain and update Sydney Water's billing systems.

OVERVIEW

Sydney Water is proposing a series of tariff changes that will significantly reduce complexity, lower administrative costs, improve customer understanding and send strong demand management signals. In some cases the proposed tariff changes also assist in achieving other objectives, such as improving environmental outcomes by mitigating incentives for illegal discharges. These reforms will reduce the number of tariff combinations by approximately 15 per cent.

The complexity of the existing tariff arrangements and the benefits of the proposed arrangements, in terms of tariff simplification, is clearly demonstrated in the figures below.

The first five proposals lead to a reduction in complexity in the charging regime, will consequently simplify the administration of the charging arrangements and will send stronger demand management signals to customers. The sixth proposal ensures that all water users make a fair and reasonable contribution to the costs of supply.

The proposed changes are set out below.

Meter size based service charges for residential properties

To ensure that charges are cost reflective it is proposed to charge the water service charge for houses on the basis of the water meter serving their property.

Exempt charges

It is proposed to change the way charges are levied on exempt properties to promote fairness and to encourage efficient water use practices.

For metered properties it is proposed that:

- council and other park owners would be required to pay full charges for parks in line with State Government or privately owned parks. This would promote better water conservation outcomes.

For unmetered properties it is proposed that either:

- these properties be metered wherever it is economical to do so to ensure that they pay for the water they use; or
- introduce a nominal charge for water usage to unmetered non-residential properties to cover estimated water usage.

Blue Mountains septic pump-out

As discussed in Appendix B to improve environmental outcomes it is proposed to change the scheme to encourage customers to connect to the existing sewerage system and to discourage practices that are detrimental to the environment. The main features of this proposal are:

- retain the Blue Mountains Septic pump-out scheme's current cost recovery arrangements for properties that do not have sewer services available for the next 2005 pricing Determination;
- restructure the regulated two-tiered usage tariff system to reduce the number of illegal sewer discharges;
- increase the financial incentives to connect for customers who have sewer services available; and
- establishment of subsidised connections program for pump-out customers, particularly for those in hardship.

Pumping of effluent

In 1988, there were around 700 Sydney Water customers that pump effluent into the sewer. Under the current policy, these customers are subsidised by Sydney Water. It is proposed to charge customers currently receiving this cross-subsidy the full sewer service charges. This increase in charges would be introduced in staged increments over the price path.

Land area distinction within Rouse Hill drainage area

It is proposed to remove the drainage land area charge for customers over 1000 square metres in the Rouse Hill area. Sydney Water proposes to apportion the charge over all Rouse Hill drainage customers from 1 July 2005.

Equivalent water usage for unmetered non-residential properties

It is proposed to charge a nominal 120 kilolitres per annum to unmetered non-residential properties to cover estimated water usage. The reform ensures that all unmetered non-residential properties pay a nominal charge for water usage. The start date for this proposed price change is1 July 2005.

DETAILS OF THE CHANGE PROPOSALS

Meter size based service charges for residential properties

Background

Under current pricing arrangements, water service charges (the fixed charge) for almost all customers are based on the size of the water meter serving their property. Commercial and industrial users with larger meters pay higher charges, while residential home units and flats that share a common meter have their total water service charge based on the size of the meter serving their complex. For separate billing of each dwelling (for example strata title home units), the resultant service charge is divided by the number of dwellings in the complex. Per dwelling, this may result in a lower service charge than that applicable to an individually metered property with the standard 20 mm meter.

Houses are currently the only group to which meter size based water service charges do not universally apply. Of the one million or so houses supplied by Sydney Water, only 23,500 (2 per cent) have meters larger than the standard 20 mm and would therefore be the only ones affected by application of universal meter size based water service charges.

In addition to standardising water charging for all customers, universal application of meter size based service charges would address a current inequity. The majority of customers contribute to system costs on the basis of their “capacity to use” while a minority of houses with meters greater than 20 mm, pay on a 20 mm basis even though they have a greater ‘capacity to use’ the system.

Proposal

It is proposed to charge the water service charge for houses on the basis of the water meter serving their property.

Impacts of the proposal

Approximately a third of the properties with a larger meter size have a block size in excess of 10,000 square metres with many located on the outskirts of Sydney. Consumption is well above the residential average with the majority of properties being classified as high water users consuming in excess of 400 kL per annum.

The number of properties with a larger meter size is indicated in Table 16.

Table 16: Residential Properties with large meters

Meter size	Number of properties
25 mm	16,557
32 mm	6,266
40 mm	715
50 mm	27
Total	**23,565**

Assuming no change in the structure of water service charge prices the customer impacts of such reform is summarised in Table 17.

Table 17: Impacts on customers' service access charges

Meter size	Annual change in water service access charge based on the 2004/2005 prices			
	Properties	**Current water service charge per annum**	**Proposed water service charge per annum**	**Revenue increase per annum**
25 mm	16,557	$77.62	$121.28	$722,878.62
32 mm	6,266	$77.62	$198.71	$758,749.94
40 mm	715	$77.62	$310.49	$166,502.05
50 mm	27	$77.62	$485.14	$11,003.04
Total	**23,565**			$1,659,133.60

Sydney Water will also provide an amnesty period of six months to allow customers to downsize their meters if they choose. This would allow them to avoid additional charges associated with the larger meter size. The revenue calculation is based on no downsizing.

Exempt charges

Background

Exempt properties receive discounts for water and sewer services. Exemptions are currently granted to parks, charities, churches, community centres and private schools. The origins of the exemption discounts relate back to legislation that was first introduced in 1916.

This proposal does not in any way affect the exemptions that currently apply for charities, churches, community centres and private schools. The proposal is only to modify the charging arrangements for council and other park owners.

Parks are divided into two categories:

- metered; and
- unmetered parks.

For those metered parks and depending on the size of the meter and services provided, exempt properties typically receive an $80 to $2,500 discount for access charges each year. Exempt properties do not pay the sewer usage charges; however, as a crude proxy they do pay a charge based on the number of toilets; a feature that is unique to exempt properties. However, this charging regime is costly to implement and inconsistent with the general tariff regime.

The proposed tariffs will be amended in the following ways:

For metered parks:

- council and other park owners would be required to pay full charges for parks in line with State Government or privately owned parks.

For unmetered parks:

- these properties could either be metered wherever it is economical to do so to ensure that they pay for the water they use; or

- introduce a nominal charge for water usage to unmetered non-residential properties to cover estimated water usage.

Based on current tariffs Sydney Water estimates it would receive between $2 million and $3 million in additional revenue per annum, rather than recovering the money through a customer service obligation (CSO) from the Government. However, Sydney Water would benefit from significant administrative savings in managing the current charging regime.

Blue Mountains septic pump-out

Background

Since 1988, Sydney Water has provided a pump-out service that was formerly operated by the Blue Mountains City Council. This service achieves two major purposes:

- provision of a subsidy to the Blue Mountains customers on the pump-out service; and
- assists achieving environmental and health objectives by encouraging customers not to discharge into the local area and possibly into the drinking supply.

The Blue Mountains pump-out scheme currently subsidises approximately 680 properties. Of this total, 90 properties currently have sewer services available and a further 230 could potentially have sewer services made available through the Priority Sewerage Program (PSP) over the next five years.

The Tribunal has regulated the price for the pump-out services provided in the Blue Mountains since 1993. For the financial year ending June 2004, regulated pricing arrangement for all properties irrespective of the availability of sewer services includes:

- a fixed septic charge:
  - $400.83 per annum;
- a three-tiered septic pump-out usage charge per kilolitre:
  - 0 - 80 kL per annum : $0/kL;
  - 81 - 100 kL per annum : $9.11/kL; and
  - greater than 100 kL per annum : $18.22/kL.

The average annual pump-out subsidy is around $1,000 per property. The cost of delivering the pump-out service was $1.13 million in 2003/04. These costs are recovered in the form of regulated revenue from the customer and a Community Service Obligation (CSO) from NSW Treasury. In 2002, customer revenue totalled $470,000 and the NSW Treasury CSO was $660,000.

Issues

In overseeing the scheme, the Blue Mountains City Council estimates that approximately 50 per cent of the pump-out customers make accidental or illegal discharges from their septic tanks. Some of the discharged effluent could potentially make its way into the creeks and rivers that form part of Sydney Water's catchment area.

There are 90 properties with sewerage services available, which may be extended to a further 230 properties over the next five years. The cost of connecting these customers is typically in the range of $3,000 to $8,000 per property.

Sydney Water's earlier proposal to levy a sewer service charge to customers with a sewerage service available was rejected by the Tribunal in the previous Determination and the use of non-price signals was identified as a substitute mechanism to encourage customers to connect.

Since 2000, Sydney Water in partnership with the Blue Mountains City Council has been actively pursuing non-financial incentives to encourage customers to connect with limited success. A list of these activities that are currently undertaken by Sydney Water and the council include:

- providing connection kits with a series of informative brochures on how to connect and the benefits of connecting;
- offering advice to new customers who have moved into the area;
- in cases of financial hardship, Sydney Water has funded connections;
- investing considerable effort into administering and supporting the scheme (almost six times the standard customer amount);
- Blue Mountains City Council has established a fund, enabling some customers to fund connection costs upfront; and
- Blue Mountains City Council has also actively sent letters directly to property owners outlining the benefits of connecting to the sewerage scheme.

Despite these efforts, the majority of customers with a sewer service available have chosen to remain on the subsidised pump-out scheme.

Sydney Water will continue to pursue the aforementioned measures to encourage customers to connect. However, the lack of success in encouraging widespread connections suggests that financial incentives and/or subsidies are necessary to ensure that the emerging environmental and health problems associated with accidental or illegal discharges are addressed.

Proposal

Sydney Water proposes to rationalise the Blue Mountains septic pump-out scheme in the following way:

- Retain existing cost recovery arrangements

  Sydney Water proposes to retain the scheme's current cost recovery arrangements for the 2005 Determination. The recovery of costs in the form of regulated customer revenue and a NSW Treasury CSO would continue into the next regulatory period. However, modifications are proposed for those properties where sewer services currently exist or will be made available in the future.

- Restructure the regulated pump-out tariff structure

  In an effort to reduce the direct discharge of effluent into the environment and the number of customer contacts, Sydney Water is proposing to restructure the regulated septic pump-out tariffs.

  Sydney Water is proposing to simplify the current tariff structure in an effort to reduce the incidence of illegal effluent discharges. Tariff reforms include:

  - increasing the free pump-out usage allowance from 80 kL/pa to 100 kL/pa;
  - removing the second tiered pump-out charge that becomes applicable after 100 kL/pa. This will reduce system complexity and make it easier to explain charges to customers; and

- rebalancing the fixed septic charge and the pump-out usage charge to ensure revenue neutrality.

- Increase the financial incentives to connect

  It is proposed that a fund be established to promote connections. The fund would be a No Interest Loan (NIL) administered by an appropriate agency. The agency would assess the customer's financial situation and determine whether funds were granted.

  Should customers not qualify for the NIL scheme or subsidised connection (detailed below), they would be granted one year's grace from the date the sewer becomes available. If the customer has not proceeded with the connection then the subsidy would be discontinued. The customer would then be required to arrange their own pump-out with a commercial supplier. Previously, Blue Mountains Council did not offer this service, however, it has started providing this service. The cost to the customer would be around $20 per kL.

- Establishment of a subsidised connections program

  Sydney Water recognises reforms to the pump-out scheme will all also need to address any ensuing social impacts. A number of customers may find it difficult to fund connection to the system and consequently assistance will be needed. The cost of connecting properties where a sewerage service is available is around $3,000 to $8,000 per property.

  Sydney Water has recently extended its social programs to cover the cost of sewerage system connections in genuine hardship cases. To date four properties within the Blue Mountains have had their sewerage system connection funded directly by Sydney Water. A further four cases are currently being assessed. Sydney Water is intending to hold discussions with NSW Treasury and Blue Mountains City Council regarding the establishment of a wider subsidised connection strategy for the scheme.

Impacts of the proposal

These proposals have a number of impacts. Some customers would be shielded from high charges by the removal of the second step tariff.

Customers who have had Sydney Water services available for over one year would receive significant increases if they were to pay full commercial pump-out rates.

The rationalisation of the Blue Mountains septic tariff is revenue neutral, however, the changes are important elements of a strategy to improve environmental outcomes by reducing the risk of accidental or illegal effluent discharges.

Pumping of effluent

Background

In 1988, there were around 700 Sydney Water customers that were required to pump effluent to the sewer. In an effort to support these customers Sydney Water administered the 'Policy on the provision of sewerage facilities and partial liability' 1988. Under this policy it was stated that: 'Properties already pumping to sewers and benefiting from concessional service charges (ie. paying half charges) will continue with this concessional treatment until further notice'. Upon purchase of the pumping of effluent property the new customer was not be granted the half sewer concession.

This policy remained until the 2000 Connected Lands Policy. The Connected Lands Policy did not specifically mention pumping of effluent customers.

Changes are required to:

- remove a cross-subsidy to the customers (currently Sydney Water is under-recovering around $52,000 per annum);
- create equity between customers who receive the same service;
- reduce administration as Sydney Water must track changes of ownership; and
- reduce system processing costs as every time there is a new sewer price the pumping price changes and needs to be tested.

Proposal

It is proposed to charge customers currently receiving the cross-subsidy for the pumping of effluent service, full sewer service charges. The subsidy would be removed in increments over the price path.

To reduce impacts on these customers, Sydney Water proposes to transition these customers to full charges.

From 1 July 2006 the pumping of effluent subsidy would be reduced to 25 per cent of the full sewer service charge then from 1 July 2007 the subsidy would cease and customers would pay the full sewer charges as regulated by the Tribunal.

Impacts of the proposal

As at June 2004 there were 310 customers that had been receiving the subsidy for 16 years. The total value of the subsidy is $50,000 per annum or approximately $170 per customer.

Land area distinction within Rouse Hill drain area

Background

A drainage land area charge is currently levied on properties over 1,000 square meters in the Rouse Hill area. These customers pay significant drainage charges, although these charges are not related to the costs of services.

A change in the tariff structure is required to:

- reduce administration costs as Sydney Water maintains 14,100 property area sizes to ensure the 67 customers are charged correctly;
- make it easier to explain charges to customers; and
- reduce system complexity by not requiring the system to confirm area size when calculating the charge every quarter.

Proposal

It is proposed to remove the drainage land area charge for customers over 1,000 square meters in the Rouse Hill area. Sydney Water proposes to apportion the charge over all the Rouse Hill drainage customers from 1 July 2005.

Impacts of the Proposal

There are 67 customers who are charged by land area in the Rouse Hill area. These customers contribute a total of approximately $80,000 per annum. These customers would see significant reductions from the removal of this charge.

It is proposed to increase the standard Rouse Hill River Management charge by apportioning the charge over the 14,100 customers. The standard River Management charge would go up by an additional $5.67 per annum. This option is revenue neutral.

Equivalent water usage for unmetered non-residential properties

Background

There are currently approximately 4,500 unmetered business properties in the Sydney Basin. The unmetered properties represent around 5 per cent of all business properties and less than 1 per cent of the total water supplied by Sydney Water.

The following table shows the breakdown of unmetered non-residential customers by property classification that are exceptionally difficult to meter. An example is where there is a large quantity of concrete or a permanent structure that would prevent a meter being fitted. However, the majority are small shops, offices or strata's typically with a single hand basin using very low quantities of water.

Table 18: Unmetered business properties

Unmetered business properties		
Property type	**Properties**	**Equivalent average metered consumption (kL)**
Industrial	504	1,713
Utilities	289	1,353
Club	37	4,276
Commercial	2,717	1,354
Market gardens etc	43	2,197
Commercial strata unit	797	345
Industrial strata unit	130	133
Other	9	1,572
Total	**4,526**	

A comprehensive metering program was last undertaken in 1996 to inspect the feasibility of metering such properties. During this program a number of meters were installed however a large proportion of properties were still deemed to be uneconomical to meter. Since then similar inspections have been undertaken on an ad hoc basis, however over recent months inspections to meter additional properties have increased.

Unmetered business customers are currently charged the default service charge irrespective of the amount of water they use and their connection size. Under existing pricing arrangements these unmetered business customers are not required to pay for the water they use. By contrast, an unmetered residential customer is required to pay an additional equivalent 'unmetered water usage charge'. This equivalent usage charge equates to the average residential water use of 240 kL per annum. A summary of the current charging arrangements for unmetered properties is provided below.

Table 19: Unmetered property charges

Unmetered property charges		
Price item	**Residential properties**	**Business properties**
Water access charge	Fixed charge based on meter size	Fixed charge based on meter size
Sewer access charge		
Water usage – unmetered	240 kL equivalent usage at $1.013 per kL	Do not pay for water used

Under the current price structure 4,500 business customers are not paying for the water they use or at least an equivalent usage charge. The properties currently receive no water conservation signal or financial incentive to have a meter installed. Furthermore, these inequalities and concerns will become increasingly important as fixed water service charges are reallocated to increasing the water usage price under the price reform proposed for this Determination.

Proposal

Sydney Water is proposing:

- to undertake an inspection program to assess the viability of metering some additional unmetered business properties. The installation of a meter will still need to be justified on financial grounds, however, advances in technology and increases in the price of water under price reforms proposed will enhance future opportunities;
- to request that the Tribunal introduce an equivalent unmetered water usage charge for those business properties who are still unmetered during the 2005 price determination process;
- for those properties that remain unmetered, if it was still deemed uneconomical to do so, request that the Tribunal introduce an equivalent unmetered usage charge. It is recommended to charge an equivalent 120 kL per annum charge for those business customers who remain unmetered. This would bring unmetered residential and business property charging arrangements in line. The equivalent 120 kL per annum is set to 50 per cent of the residential unmetered charge and compares to the typical small shop or office water usage of around 50 to 150 kL per annum.

Sydney Water would receive an increase in revenue of approximately $500,000 based on current prices.

REDUCTION IN SYDNEY WATER'S COSTS

Tariff complexity is a significant driver of the cost of customer service operations. In general, exemptions, exceptions and special arrangements for certain customer groups involve staff resources in maintaining and updating customer account data and in handling additional enquiries and disputes. Complex tariff structures add to staff training times and increase the risk of errors. Tariff complexity also increases the cost of maintaining, updating and testing the IT systems that support customer billing.

The proposed suite of tariff rationalisations will deliver a significant reduction in costs to Sydney Water. The operating expenditure projections included in this submission

assume a reduction in annual operating costs of $500,000 as a result of tariff rationalisation (see Figure 6 and Figure 7).

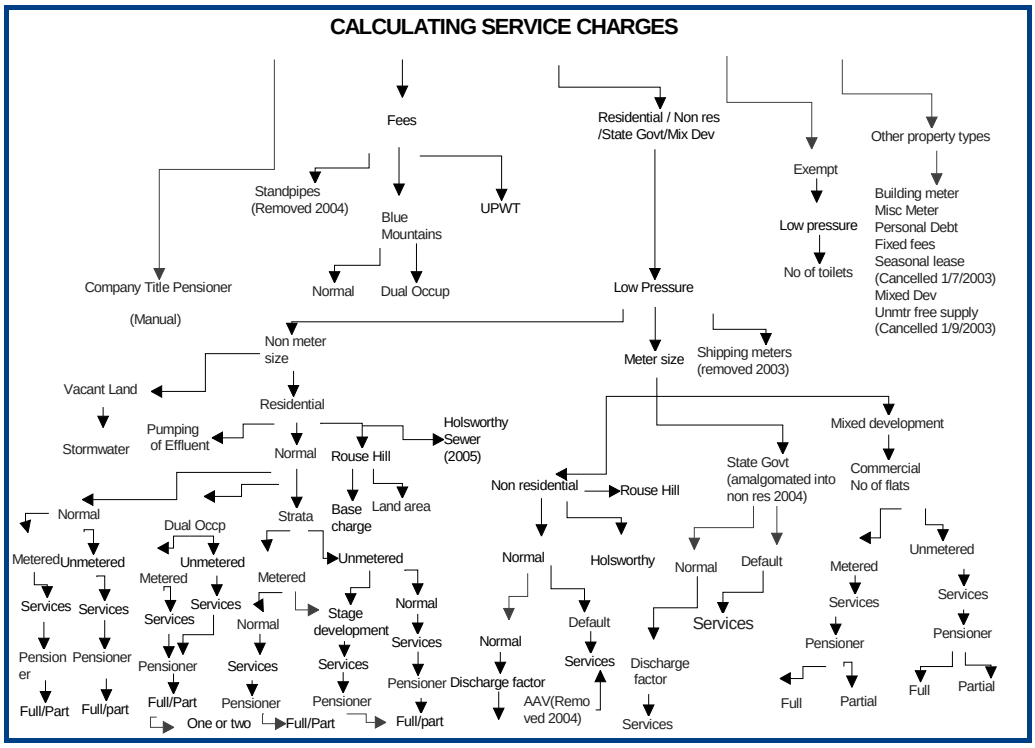


Figure 6: Current method for 'Calculating Service Charges'[9]

[9] Excludes additional layer for step tariff pricing.

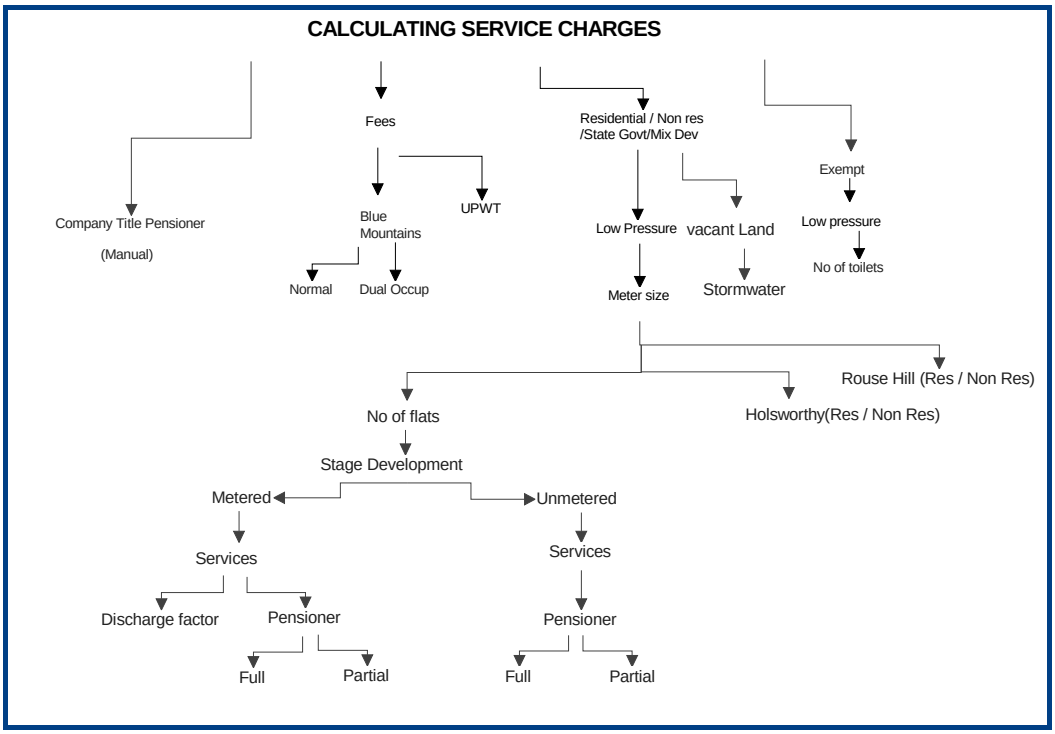


Figure 7: Proposed method for 'Calculating Service Charges'[10]

[10] Excludes additional layer for step tariff pricing.

Appendix H – Pricing schedules

Proposed fees and charges, to apply from 1 July 2005 to 30 June 2009, in dollars of 2004/05.

ANNUAL SERVICE CHARGES (2004/05 DOLLARS)

See notes 1, 2 and 3.

Table 20: Annual service charges (2004.05 dollars) - Option 1 (No Step) and Option 2 (Stepped Tariff)

Charge	2004/05 (current)	2005/06	2006/07	2007/08	2008/09
Water					
Standard	$77.62	$72.00	$68.00	$66.00	$62.00
Unmetered residential – Option 1 (no step) [1]	$330.78	$357.00	$373.00	$391.00	$412.00
Unmetered residential – Option 2 (step) [1]	$330.78	$343.25	$364.25	$383.50	$405.75
Wastewater					
Standard	$346.66	$368.00	$376.00	$384.00	$393.60
Stormwater					
Residential	$25.04	$32.00	$36.00	$40.00	$44.00
Non-residential	$70.64	$80.00	$92.00	$104.00	$112.00

Notes

*[1] Comprised of a Water Service Component and a notional Water Usage Component (250kL * usage charge). Note the notional water usage component for 2004/05 is $253.16.*

1: Service or availability charges for residential flats, dual occupancies, Community Title developments, Strata Title home units, Company Title home units and non-residential Strata Title developments may reflect the number of individual dwellings, units or strata lots in the complex.

2: The standard service charge for water and wastewater for 1 x 20 mm water meter. Some classes of properties pay water and/or wastewater service charges that reflect the size(s) of water meter(s) fitted to the property – see the attached schedule for meter size charges.

3: Developed properties in Priority Sewerage Program areas may be subject to the applicable service charge for wastewater from the time at which a Sydney Water sewer main becomes available for connection. This will be charged regardless of whether the customer connects to the sewer main. Developed properties are those that have facilities that would normally be connected to a sewer main.

USAGE CHARGES (2004/05 DOLLARS)

See notes 4 and 7

Table 21: Usage Charges (2004/05 dollars) - Option 1 (No Step) and Option 2 (Stepped Tariff)

Charge	2004/05 (current)	2005/06	2006/07	2007/08	2008/09
Water					
Water Usage charge (per kl) – Option 1 (No step)	$1.013	$1.140	$1.220	$1.300	$1.400
Unfiltered water – Option 1 (no step)	$0.765	$0.973	$1.052	$1.130	$1.227
Water Usage charge (per kl) – Option 2 (Step Tariff)	$1.013	$1.085	$1.185	$1.270	$1.375
Water Usage charge (per kl) – Option 2 (Step Tariff) – houses >400	Na	$1.800	$1.800	$1.800	1.800
Water Usage charge (per kl) – Option 2 (Step Tariff)	$0.765	$0.918	$1.017	$1.100	$1.202
Wastewater					
non-residential sewer usage (per kilolitre) (for discharges above 1.37 kL per day)	$1.146	$1.150	$1.150	$1.150	$1.150

Notes

4: Price changes to apply from the meter reading/charging period commencing on or after 1 July and concluding on or after 1 October each year.

ANNUAL METER SIZE BASED WATER CHARGES (2004/05 DOLLARS)

See Note 6

Table 22: Annual meter size based water charges (2004/05 dollars)

Water Meter Size	2004/05 (current)	2005/06	2006/07	2007/08	2008/09
20 mm	$77.62	$72.00	$68.00	$66.00	$62.00
> 20 mm	(nominal diameter)^2 x $77.62/400	(nominal diameter)^2 x $72.00/400	(nominal diameter)^2 x $68.00/400	(nominal diameter)^2 x $66.00/400	(nominal diameter)^2 x $62.00/400

ANNUAL METER SIZE BASED SEWERAGE CHARGES (2004/05 DOLLARS)

See Note 6 and 7

Table 23: Annual mater size based sewerage charges (2004/05 dollars)

Charge – with Sewer (100% Discharge Factor)	**2004/05 (Current)**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
20 mm	$346.66	$368.00	$376.00	$384.00	$393.00
> 20 mm	(nominal diameter)^{2}x $346.66/400	(nominal diameter)^{2}x $368.00/400	(nominal diameter)^{2}x $376.00/400	(nominal diameter)^{2}x $384.00/400	(nominal diameter)^{2}x $393.00/400

Notes

6. Nominal diameter means the size of the water meter as recorded in Sydney Water's customer database.

7. Non-residential properties are assigned a discharge factor, which is designed to reflect the percentage of metered water use discharged to the sewer. The discharge factor is used in the calculation of both sewer usage charges and meter sized based sewerage service charges. Regardless of the discharge factor the sewerage service charge for any property cannot be less than the sewerage service charge for a 20mm meter with 100% discharge factor.

MINOR MISCELLANEOUS CHARGES (2004/05 DOLLARS)

Table 24: Minor miscellaneous charges (2004/05 dollars)

Charge	**2004/05 (current)**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Sewerage services rendered to exempt properties					
Annual charge per UC or WC	$80.38	$80.38	$80.38	$80.38	$80.38
Metered Standpipe Charges					
Annual availability (25mm outlet)	$121.28	As per water service charge for metered properties			
Annual availability (32mm outlet)	$198.71	As per water service charge for metered properties			
Usage charges (per kilolitre)[1]	$1.013	As per water usage charge for metered properties			
Blue Mountains septic pump-out[2]					
Annual service	$400.83	tba	tba	tba	tba
Usage charges (per kilolitre)					
- First tier (80-100 kL per annum)	$9.11	tba	tba	tba	tba
- Second tier (100 kL per annum)	$18.22	tba	tba	tba	tba

Notes:

1. To apply from the meter reading/charging period commencing on or after 1 July and concluding on or after 1 October each year.

2. These charges will only apply until such time as a sewer main becomes available for connection.

ROUSE HILL DEVELOPMENT AREA CHARGES (2004/05 DOLLARS)

Table 25: Rouse Hill development area charges (2004/05 dollars)

Charge	**2004/05 (current)**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
Recycled water usage[1] (per kilolitre)	$0.286	$0.286	$0.286	$0.286	$0.286
River management charge[2] (annual)	$105.35	tba	tba	tba	tba
Recycled Water Service Access Charge (based on meter size)					
Meter size					
20 mm	$24.70	$24.70	$24.70	$24.70	$24.70
>20 mm	(nominal diameter)^{2}x $24.70/400	(nominal diameter)^{2}x$24.70/400			

Notes:

1. To apply from meter reading/charging periods commencing on or after 1 July and concluding after 1 October each year.

2. For land area greater than 1,000 square meters the non residential drainage charge is the drainage base charge multiplied by the number of equivalent 1,000 square meters lots occupied. – (to be reviewed as part of the proposed tariff rationalisation process)

MISCELLANEOUS AND TRADE WASTE CHARGES

Table 26: Miscellaneous charges (2004/05 dollars)

2004/05 (current)	**2005/06**	**2006/07 to 2008/09**
Current charges in accordance with the Tribunal's September 2003 Determination	See Table 15 Appendix F	Prices to be adjusted by increases in labour costs as explained in the submission – Appendix G for 2006/07, 2007/08 and 2008/09.

Table 27: Trade waste charges (2004/05 dollars)

2004/05 (current)	**2005/06**	**2006/07 to 2008/09**
Current charges in accordance with the Tribunal's September 2003 Determination	Relevant charges in Appendix F to be adjusted for CPI as stated in submission	Prices to be adjusted by CPI for 2006/07, 2007/08 and 2008/09

Appendix I – Rate of Return Scenarios

As discussed in Section 6.3 in the Submission Sydney Water recognises that it is the Tribunal's role to determine an appropriate rate of return for Sydney Water's regulated business. Sydney Water has modelled the price impacts of a medium point of 6.5 per cent in the WACC range set by the Tribunal in June 2004 for the NSW electricity distributors. In the Submission, Sydney Water notes that the mid-point is 0.5 per cent lower than the 7.0 per cent real pre-tax WACC recently set by the Tribunal for the NSW electricity network operators. This is significantly above the equivalent rates of return on the regulatory asset base of around 5.6% previously allowed for Sydney Water. To illustrate the impacts of a different rate of return the price outcomes of 6 per cent and 7.5 per cent are provided below.

PRICE SCENARIOS

The price variation for a 6 per cent and 7.5 per cent rate of return have been modelled in Table 28 to Table 33 below. These tables can be compared to the tables in the submission (Section 7.2.9) where the price scenario for a 6.5 per cent rate of return is presented. All of the options transition to achieve the rate of return in the final year of the Determination (2008/09). As all options have a 7 per cent real increase in the first year, the prices and the customer impacts in 2005/06 are the same. All options presented in the Submission (namely no reform, an increased usage option and a step tariff) have been modelled in this Appendix for the different rate of return range.

6.0 per cent rate of return by 2008/09

To transition to a 6 per cent rate of return by 2008/09 the price increases modelled have been based on a 7 per cent real increase in the first year, followed by a 2.67 per cent real increase in the remaining years of the Determination.

Table 28: No Reform

2004/05 dollars	current (2004/05)	2005/06	2006/07	2007/08	2008/09
Service Charges (per year)					
Water	$77.62	$83.05	$85.27	$87.55	$89.89
Sewer	$346.66	$370.93	$380.83	$391.00	$401.44
Stormwater (residential)	$25.05	$26.80	$27.52	$28.25	$29.00
Stormwater (non res)	$70.65	$75.59	$77.61	$79.68	$81.81
Usage charges - apply from qtr 2 (per kL)					
Water	$1.0130	$1.0839	$1.1129	$1.1426	$1.1731
houses> 100 kL/quarter	N/A	N/A	N/A	N/A	N/A
Sewer	$1.1460	$1.2262	$1.2590	$1.2926	$1.3271

Table 29: Stepped Tariff

2004/05 dollars	current (2004/05)	2005/06	2006/07	2007/08	2008/09
Service Charges (per year)					
Water	$77.62	$78.00	$68.00	$60.00	$49.60
Sewer	$346.66	$362.40	$367.60	$373.00	$377.60
Stormwater (residential)	$25.05	$32.00	$36.00	$40.00	$42.00
Stormwater (non res)	$70.65	$80.00	$92.00	$104.00	$112.00
Usage charges - apply from qtr 2 (per kL)					
Water	$1.0130	$1.0850	$1.1850	$1.2700	$1.3750
houses>100kL/quarter	$1.0130	$1.8000	$1.8000	$1.8000	$1.8000
Sewer	$1.1460	$1.1500	$1.1500	$1.1500	$1.1500

Table 30: Increased Water Usage Price - no step

2004/05 dollars	current (2004/05)	2005/06	2006/07	2007/08	2008/09
Service Charges (per year)					
Water	$77.62	$78.00	$68.00	$60.00	$49.60
Sewer	$346.66	$362.40	$367.60	$373.00	$377.60
Stormwater (residential)	$25.05	$32.00	$36.00	$40.00	$42.00
Stormwater (non res)	$70.65	$80.00	$92.00	$104.00	$112.00
Usage charges - apply from qtr 2 (per kL)					
Water	$1.0130	$1.1400	$1.2200	$1.3000	$1.4000
houses>100 kL/quarter	N/A	N/A	N/A	N/A	N/A
Sewer	$1.1460	$1.1500	$1.1500	$1.1500	$1.1500

7.5 per cent rate of return by 2008/09

To transition to a 7.5 per cent rate of return by 2008/09 the price increases modelled have been based on a 7 per cent real increase in the first year, followed by a 5.92 per cent real increase in the remaining years of the Determination.

Table 31: No Reform

2004/05 dollars	current (2004/05)	2005/06	2006/07	2007/08	2008/09
Service Charges (per year)					
Water	$77.62	$83.05	$87.97	$93.18	$98.69
Sewer	$346.66	$370.93	$392.89	$416.14	$440.78
Stormwater (residential)	$25.05	$26.80	$28.39	$30.07	$31.85
Stormwater (non res)	$70.65	$75.59	$80.07	$84.81	$89.83
Usage charges - apply from qtr 2 (per kL)					
Water	$1.0130	$1.0839	$1.1481	$1.2160	$1.2880
houses> 100 kL/quarter	N/A	N/A	N/A	N/A	N/A
Sewer	$1.1460	$1.2262	$1.2988	$1.3757	$1.4571

Table 32: Stepped Tariff

2004/05 dollars	current (2004/05)	2005/06	2006/07	2007/08	2008/09
Service Charges (per year)					
Water	$77.62	$78.00	$68.00	$60.00	$49.60
Sewer	$346.66	$362.40	$367.60	$373.00	$377.60
Stormwater (residential)	$25.05	$32.00	$36.00	$40.00	$42.00
Stormwater (non res)	$70.65	$80.00	$92.00	$104.00	$112.00
Usage charges - apply from qtr 2 (per kL)					
Water	$1.0130	$1.0850	$1.1850	$1.2700	$1.3750
houses>100kL/quarter	$1.0130	$1.8000	$1.8000	$1.8000	$1.8000
Sewer	$1.1460	$1.1500	$1.1500	$1.1500	$1.1500

Table 33: Increased Water Usage Price - no step

2004/05 dollars	current (2004/05)	2005/06	2006/07	2007/08	2008/09
Service Charges (per year)					
Water	$77.62	$72.00	$68.00	$66.00	$62.00
Sewer	$346.66	$368.00	$388.00	$408.00	$425.60
Stormwater (residential)	$25.05	$32.00	$38.00	$44.00	$48.00
Stormwater (non res)	$70.65	$80.00	$92.00	$104.00	$116.00
Usage charges - apply from qtr 2 (per kL)					
Water	$1.0130	$1.1400	$1.2350	$1.3450	$1.4850
houses>100 kL/quarter	N/A	N/A	N/A	N/A	N/A
Sewer	$1.1460	$1.1500	$1.1500	$1.1500	$1.1500

Customer impacts of pricing proposals for a varying rate of return

Price structure change means that there will not be a uniform increase in all prices, and the impact on customers will vary depending on both the services they use and the extent to which they use them.

These reforms involve differing levels of price increase for each service (ie. water, wastewater and stormwater) based on their relative increases in costs and a stronger emphasis on water usage prices as a means of influencing demand.

As discussed in Section 6.4 Sydney Water's proposal for cost reflective water pricing is embodied in two alternative pricing structure options:

- **Option 1: Stepped price structure:** reflects the Tribunal's proposed price structure for metered households. The option involves a water usage charge for all customers (residential and non-residential) rising to a $1.38/kL by the end of the Determination period (2008/09), with a second tier water usage charge of a $1.80/kL introduced at the start of the Determination period for metered house customers consuming more than 100 kL/quarter.[11] The modelling undertaken by Sydney Water has been undertaken so as these prices are independent of the rate of return the Tribunal selects.
- **Option 2: A larger usage component:** maintains Sydney Water's current two part tariff structure, but holds the access charge constant and generates all additional water revenue through an increase in the usage price. This price will be in the range of $1.40-$1.49 by 2008/09 depending on the rate of return determined by the Tribunal.

Wastewater and stormwater services pricing proposals have been confined to a single option – retention of the existing price structures, with an increase in the fixed access charge for each service, reflective of service costs.

[11] For the purposes of illustrating customer impacts Sydney Water has used annual consumption of 400 kL/annum as a proxy for estimating those customers consuming in excess of 100 kL/quarter.

The following impact analysis (Table 34 to Table 36)explores the changes in customers' total water and sewerage bill assuming no restructure, a stepped price and a larger usage component for a range of rates of return. This analysis is based on Sydney Water's revenue requirement recovering a real pre-tax WACC in the range of 6 per cent to 7.5 per cent.

Table 34: Customer impacts with no reform

Customer type	*6% rate of return*		*6.5% rate of return*		*7.5% rate of return*	
2004/05 dollars	Bill increase	Average/annum	Bill increase	Average/annum	Bill increase	Average/annum
House using 100kL	16%	$21	20%	$26	27%	$35
House using 250kL	16%	$27	20%	$33	27%	$45
House using 500kL	16%	$37	20%	$45	27%	$62
Home unit (160kL)	16%	$21	20%	$26	27%	$36
Small Business 160kL	16%	$23	20%	$29	27%	$39
Medium Business 3,300kL	16%	$264	19%	$323	26%	$440
Large Business 285,000kL[1]	16%	$21,060	19%	$25,100	26%	$35,000

Table 35: Customer impacts with Increased usage component

Customer type	*6% rate of return*		*6.5% rate of return*		*7.5% rate of return*	
2004/05 dollars	Bill increase	Average/annum	Bill increase	Average/annum	Bill increase	Average/annum
House using 100kL	8%	$10	13%	$17	21%	$27
House using 250kL	14%	$24	18%	$31	26%	$44
House using 500kL	20%	$47	23%	$54	31%	$71
Home unit (160kL)	15%	$20	19%	$25	27%	$36
Small Business 160kL	11%	$16	15%	$23	23%	$33
Medium Business 3,300kL	18%	$304	20%	$327	25%	$411
Large Business 285,000kL	20%	$26,800	20%	$27,100	25%	$32,800

Table 36: Customer impacts with a step tariff

Customer type	*6% rate of return*		*6.5% rate of return*		*7.5% rate of return*	
2004/05 dollars	Bill increase	Average/annum	Bill increase	Average/annum	Bill increase	Average/annum
House using 100kL	3%	$9	13%	$16	20%	$26
House using 250kL	8%	$22	17%	$29	25%	$42
House using 500kL	24%	$55	27%	$62	35%	$81
Home unit (160kL)	14%	$19	18%	$24	26%	$35
Small Business 160kL	10%	$14	15%	$22	22%	$32
Medium Business 3,300kL	17%	$282	18%	$306	23%	$386
Large Business 285,000kL	19%	25K	19%	$25.2K	23%	$30.5K