IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services

From 1 July 2008

Water — Draft Determination and Draft Report
March 2008

IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Prices for Sydney Water Corporation's water, sewerage, stormwater and other services

Draft Determination No. 1, 2008
From 1 July 2008 to 30 June 2012

Reference no. 07/317

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Preliminary

1. Background

(1) Section 12 of the *Independent Pricing and Regulatory Tribunal Act 1992* (**IPART Act**) provides that IPART will conduct investigations and make reports to the Minister on the determination of the pricing for a specified government monopoly service referred to IPART by the Minister.

(2) Sydney Water Corporation (the **Corporation**) is listed as a government agency for the purposes of schedule 1 of the IPART Act. The services of the Corporation declared as monopoly services under the *Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997* (**Order**) are:

(a) water supply services;

(b) sewerage services;

(c) stormwater drainage services;

(d) trade waste services;

(e) services supplied in connection with the provision or upgrading of water supply and sewerage facilities for new developments and, if required, drainage facilities for such developments;

(f) ancillary and miscellaneous customer services for which no alternative supply exists and which relate to the supply of services of a kind referred to in paragraphs (a) to (e);

(g) other water supply, sewerage and drainage services for which no alternative supply exists,

(together the **Monopoly Services**)

(3) In September 2005, IPART issued Determination No 5, 2005 which was a pricing determination for the Monopoly Services for the period from 1 October 2005 to 30 June 2009. Determination No 5, 2005 was

conducted pursuant to IPART's standing reference under section 11 of the IPART Act.

(4) On 13 June 2007, IPART received a letter from the Premier requesting IPART to make a new price determination for the Corporation's monopoly services pursuant to section 12 of the IPART Act. The Premier requested that, in making the new determination, the matters to be considered by IPART should include:

(a) all aspects of the Corporation's revenue and expenditure;

(b) the effects of climatic conditions on the Corporation's revenue position since Determination No 5, 2005;

(c) the desalination project being undertaken by the Corporation;

(d) recycling projects, including the Western Sydney Recycled Water Initiative Replacement Flows Project and Camellia Recycled Water Project;

(e) extension of the Water Savings Fund as part of the Climate Change Fund; and

(f) extensions to existing rebates.

(5) On 5 July 2007, IPART received a letter from the Minister for Water Utilities directing IPART under section 16A of the IPART Act to include in the new price determination an amount representing the efficient cost of complying with the requirements imposed on the Corporation to arrange for:

(a) the construction of a desalination plant on the Kurnell Peninsula (and associated infrastructure) for the supply of an annual average production of up to 250 mega-litres of drinking water per day (scaleable to 500 mega-litres per day); and

(b) the construction of distribution pipelines capable of delivering 500 mega-litres per day across Botany Bay.

(6) On 23 August 2007, IPART received a letter from the Minister for Water Utilities directing IPART under section 16A of the IPART Act to include in the new price determination an amount representing the efficient cost of complying with the direction to the Corporation to construct, operate and undertake the Western Sydney Recycled Water Initiative Replacement Flows Project, consisting of:

(a) an Advanced Water Treatment Plant with interconnecting systems from Penrith, St Marys and Quakers Hill Sewage Treatment Plants;

(b) associated infrastructure and a pipeline from the treatment plant; and

(c) a pilot plant at St Mary's Sewage Treatment Plant and associated infrastructure.

(7) In investigating and reporting on the pricing of the Corporation's Monopoly Services, IPART has had regard to a broad range of matters, including:

(a) the issues requested by the Premier;

(b) the issues directed by the Minister for Water Utilities; and

(c) the criteria set out in section 15(1) of the IPART Act.

(8) In accordance with section 13A of the IPART Act, IPART has fixed a maximum price for the Corporation's Monopoly Services or has established a methodology for fixing the maximum price. Certain prices in this determination have been set using a methodology to allow the incorporation of future changes to the price of water supplied to the Corporation by the Sydney Catchment Authority. Reasons for the use of a methodology, as required by the IPART Act, are set out in Schedule 9.

(9) Under section 18(2) of the IPART Act, the Corporation may not fix a price below that determined by IPART without the approval of the Treasurer.

2. Application of this determination

(1) This determination fixes the maximum prices or sets a methodology for fixing the maximum prices that the Corporation may charge for the Monopoly Services specified in this determination.

(2) This determination commences on the later of 1 July 2008 and the date that it is published in the NSW Government Gazette (**Commencement Date**).

(3) The maximum prices in this determination apply from the Commencement Date to 30 June 2012. The maximum prices in this determination prevailing at 30 June 2012 continue to apply beyond 30 June 2012 until this determination is replaced.

3. Replacement of Determination No. 5 of 2005 and Determination No. 9 of 2006

Subject to clause 2.4(b) of schedule 8, this determination replaces Determination No. 5 of 2005 and Determination No. 9 of 2006 from the Commencement Date. The replacement does not affect anything done or omitted to be done, or rights or obligations accrued, under Determination No. 5 of 2005 or Determination No. 9 of 2006 prior to their replacement.

4. Monitoring

IPART may monitor the performance of the Corporation for the purposes of:

(a) establishing and reporting on the level of compliance by the Corporation with this determination; and

(b) preparing a periodic review of pricing policies in respect of the Monopoly Services supplied by the Corporation.

5. Climate Change Fund

The Corporation has been required to make a net contribution of $15 million to the Climate Change Fund established by the *Energy and Utilities Administration Act 1987*. Any further contribution that is made by the Corporation to the Climate Change Fund will (subject to any legal or regulatory requirements applying to that contribution), be taken as falling outside the scope of this determination.

6. Schedules

Schedules 1-7 (inclusive) and the Tables in those schedules set out the maximum prices that the Corporation may charge for the Monopoly Services specified in the schedules.

7. Definitions and Interpretation

Definitions and interpretation provisions used in this determination are set out in schedule 8.

Schedule 1 – Water Supply Services

1. Application

This schedule sets the maximum prices that the Corporation may charge for services under paragraph (a) of the Order (water supply services), (other than those set out in schedule 7).

2. Categories for pricing purposes

Prices for water supply services have been determined for 4 categories:

(a) Metered Properties;

(b) Metered Standpipes;

(c) Unmetered Properties; and

(d) Properties not connected to the Water Supply System.

3. Charges for water supply services to Metered Properties

3.1 Metered Residential Properties – Filtered Water

The maximum price that may be levied by the Corporation for the provision of Filtered Water to a Metered Residential Property connected to the Water Supply System for a Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1 (with that Metered Residential Property taken to have a 20mm Meter size regardless of its actual Meter size), corresponding to the applicable Period in that table; and

q = the number of quarters in that Period; and

(ii) the water usage charge calculated as follows:

(A) **for each kL of water used up to and including the Tier 1 Water Consumption** - the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used up to and including the Tier 1 Water Consumption for the corresponding Meter Reading Period and the applicable Period in that table;

(B) **for each kL of water used in excess of the Tier 1 Water Consumption** - the tier 2 water usage charge in Table 2, multiplied by each kL of Filtered Water used in excess of the Tier 1 Water Consumption for the corresponding Meter Reading Period and the applicable Period in that table.

(b) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P_{SCA}^{t}}{q}$$

Where:

SC = the water service charge in Table 1 (with that Metered Residential Property taken to have a 20mm Meter size regardless of its actual Meter size), corresponding to the applicable Period in that table;

q = the number of quarters in that Period; and

$\mathbf{\Delta P_{SCA}^{t}}$ = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the water usage charge calculated as follows:

(A) **for each kL of water used up to and including the Tier 1 Water Consumption** - the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used up to and including the Tier 1 Water Consumption for the corresponding Meter Reading Period and the applicable Period in that table;

(B) **for each kL of water used in excess of the Tier 1 Water Consumption** - the tier 2 water usage charge in Table 2 or $1.83/kL (whichever is greater), multiplied by each kL of Filtered Water used in excess of the Tier 1 Water Consumption for the corresponding Meter Reading Period and the applicable Period in that table.

3.2 Metered Residential Properties – Unfiltered Water

The maximum price that may be levied by the Corporation for the provision of Unfiltered Water to a Metered Residential Property connected to the Water Supply System for a Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1 (with that Metered Residential Property taken to have a 20mm Meter size regardless of its actual Meter size), corresponding to the applicable Period in that table; and

q = the number of quarters in that Period; and

(ii) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

(b) **for each Period from 1 July 2009 to 30 June 2012**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P^{t}_{SCA}}{q}$$

Where:

SC = the water service charge in Table 1 (with that Metered Residential Property taken to have a 20mm Meter size regardless of its actual Meter size), corresponding to the applicable Period in that table;

q = the number of quarters in that Period; and

ΔP^{t}_{SCA} = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

3.3 Metered Non Residential Property – Filtered Water

The maximum price that may be levied by the Corporation for the provision of Filtered Water to a Metered Non Residential Property connected to the Water Supply System for a Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table; and

q = the number of quarters in that Period; and

(ii) the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

(b) **for each Period from 1 July 2009 to 30 June 2012**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P^{t}_{SCA}}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table;

q = the number of quarters in that Period; and

ΔP^{t}_{SCA} = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

3.4 Metered Non Residential Property – Unfiltered Water

The maximum price that may be levied by the Corporation for the provision of Unfiltered Water to a Metered Non Residential Property connected to the Water Supply System for a Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table; and

q = the number of quarters in that Period; and

(ii) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

(b) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P^{t}_{SCA}}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table;

q = the number of quarters in that Period; and

ΔP^{t}_{SCA} = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

4. Charges for water supply services to Metered Standpipes

4.1 Filtered Water

The maximum price that may be levied by the Corporation for the provision of Filtered Water to a Metered Standpipe connected to the Water Supply System for a Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table; and

q = the number of quarters in that Period; and

(ii) the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

(b) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P^{t}_{SCA}}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table;

q = the number of quarters in that Period; and

$\mathbf{\Delta P^t_{SCA}}$ = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

4.2 Unfiltered Water

The maximum price that may be levied by the Corporation for the provision of Unfiltered Water to a Metered Standpipe connected to the Water Supply System for a Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009**:

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table; and

q = the number of quarters in that Period; and

(ii) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

(b) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P^t_{SCA}}{q}$$

Where:

SC = the water service charge in Table 1 for each Meter, corresponding to the applicable Meter size and Period in that table;

q = the number of quarters in that Period; and

$\mathbf{\Delta P^t_{SCA}}$ = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table.

5. Charges for water supply services to Unmetered Properties

5.1 Unmetered Residential Property

The maximum price that may be levied by the Corporation for water supply services to an Unmetered Residential Property connected to the Water Supply System for a Billing Cycle is the water service charge calculated as follows:

(a) **from the Commencement Date to 30 June 2009:**

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 4, corresponding to the applicable Period in that table; and

q = the number of quarters in that Period.

(b) **for each Period from 1 July 2009 to 30 June 2012:**

$$\frac{SC}{q} + \frac{\Delta P^t_{SCA}}{q}$$

Where:

SC = the water service charge in Table 4, corresponding to the applicable Period in that table;

q = the number of quarters in that Period; and

$\mathbf{\Delta P^t_{SCA}}$ = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8).

5.2 Unmetered Non Residential Property

The maximum price that may be levied by the Corporation for water supply services to an Unmetered Non Residential Property for a Billing Cycle is the water service charge calculated as follows:

(a) **from the Commencement Date to 30 June 2009:**

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 5, corresponding to the applicable Period in that table; and

q = the number of quarters in that Period.

(b) **for each Period from 1 July 2009 to 30 June 2012:**

$$\frac{SC}{q} + \frac{\Delta P^t_{SCA}}{q}$$

Where:

SC = the water service charge in Table 5, corresponding to the applicable Period in that table;

q = the number of quarters in that Period; and

$\mathbf{\Delta P^t_{SCA}}$ = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8).

6. Charges for water supply services to a Property not connected to the Water Supply System

The maximum water service charge and water usage charge that may be levied by the Corporation for a Property not connected and which remains not connected to the Water Supply System is zero for the period from the Commencement Date until the date that this determination ceases to apply.

7. Levying water supply charges on Multi Premises

7.1 Water supply charges for Multi Premises

(1) Clause 7 of this schedule prescribes how the maximum prices in this schedule are to be levied on Multi Premises, specifically how they are to be levied on persons who own, control or occupy those Multi Premises.

(2) Clause 3 of this schedule does not apply to Metered Properties if this clause 7 is capable of applying to those Metered Properties.

7.2 Strata Title Lot and Community Development Lot

(1) For a Strata Title Building or a Community Parcel:

(a) which is connected to the Water Supply System; and

(b) which has a Common Water Meter or multiple Common Water Meters,

the maximum price that may be levied by the Corporation for the provision of water supply services for a Billing Cycle is:

(c) the water service charge calculated as follows:

(i) **from the Commencement Date to 30 June 2009:**

$$\frac{SC}{q} \times \frac{1}{n}$$

(the resultant amount being the **Multi Water Service Charge**),

Where:

SC = the water service charge in Table 1 for each Common Water Meter (corresponding to the applicable Meter size and Period in that table);

q = the number of quarters in that Period; and

n = the number of Strata Title Lots within that Strata Title Building or the number of Community Development Lots within that Community Parcel (as the case may be).

(ii) **for each Period from 1 July 2009 to 30 June 2012:**

$$\left(\frac{SC}{q} \times \frac{1}{n} \right) + \frac{\Delta P^{t}_{SCA}}{q}$$

(the resultant amount being the **Multi Water Service Charge**),

Where:

SC = the water service charge in Table 1 for each Common Water Meter (corresponding to the applicable Meter size and Period in that table);

q = the number of quarters in that Period;

n = the number of Strata Title Lots within that Strata Title Building or the number of Community Development Lots within that Community Parcel (as the case may be);

$\mathbf{\Delta P^{t}_{SCA}}$ = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(d) the tier 1 water usage charge in Table 2, multiplied by each kL of Filtered Water used during the Meter Reading Period, corresponding to the applicable Period in that table (**Multi Tier 1 Water Usage Charge**); and

(e) the water usage charge in Table 3, multiplied by each kL of Unfiltered Water used for the corresponding Meter Reading Period and the applicable Period in that table (**Multi Unfiltered Water Usage Charge**).

(2) The relevant Multi Water Service Charge is to be levied on each Strata Title Lot (within that Strata Title Building) or Community Development Lot (within that Community Parcel) (as the case may be).

(3) The Multi Tier 1 Water Usage Charge and the Multi Unfiltered Water Usage Charge are to be levied on the Owners Corporation of that Strata Title Building or the owner of that Community Parcel (as the case may be).

7.3 Company Title Building

For a Company Title Building:

(a) which is connected to the Water Supply System; and

(b) which has a Common Water Meter or multiple Common Water Meters,

the maximum price that may be levied by the Corporation on the owner of that Company Title Building for the provision of water supply services to that Company Title Building for a Billing Cycle is the sum of the following:

(c) **from the Commencement Date to 30 June 2009:**

(i) the water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the water service charge in Table 1, for each Common Water Meter, corresponding to the applicable Meter size and Period in that table; and

q = the number of quarters in that Period; and

(ii) the tier 1 water usage charge for Filtered Water in Table 2, corresponding to the applicable Period in that table, multiplied by each kL of Filtered Water used during the Meter Reading Period; and

(iii) the water usage charge for Unfiltered Water in Table 3, corresponding to the applicable Period in that table, multiplied by each kL of Unfiltered Water used during the Meter Reading Period.

(d) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the water service charge calculated as follows:

$$\frac{SC}{q} + \frac{\Delta P^{t}_{SCA}}{q}$$

Where:

SC = the water service charge in Table 1, for each Common Water Meter, corresponding to the applicable Meter size and Period in that table;

q = the number of quarters in that Period; and

ΔP^{t}_{SCA} = the adjustment to the water service charge to reflect the change in the price of water supplied by the Sydney Catchment Authority to the Corporation (as defined in clause 1.3 of Schedule 8); and

(ii) the tier 1 water usage charge for Filtered Water in Table 2, corresponding to the applicable Period in that table, multiplied by each kL of Filtered Water used during the Meter Reading Period; and

(iii) the water usage charge for Unfiltered Water in Table 3, corresponding to the applicable Period in that table, multiplied by each kL of Unfiltered Water used during the Meter Reading Period.

7.4 Multi Premises (other than a Multi Premises levied under clause 7.2 or 7.3 of this schedule)

For a Multi Premises (other than a Multi Premises levied under clause 7.2 or 7.3 of this schedule) which:

(a) is connected to the Water Supply System; and

(b) has a Common Water Meter or multiple Common Water Meters,

the maximum price for the provision of water supply services under this schedule is to be levied by the Corporation based on its usual practice at the Commencement Date.

7.5 Strata Title Lot, Company Title Dwelling or Community Development Lot with its own Meter within a Multi Premises

For the avoidance of doubt, a Strata Title Lot, a Company Title Dwelling or a Community Development Lot (as the case may be) with its own Meter within a Multi Premises are each deemed to be a single Property for the purposes of levying water charges under this schedule and clause 3 (and not clause 7) of this schedule is to apply to that Strata Title Lot, Company Title Dwelling or Community Development Lot (as the case may be).

Tables 1, 2, 3, 4 and 5

Table 1 Water service charge for Metered Properties

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Metered Residential Properties – water service charge	66.89	79.85 x (1+ΔCPI$_1$)	91.17 x (1+ΔCPI$_2$)	104.62 x (1+ΔCPI$_3$)
Metered Non Residential Properties and Multi Premises (which are Residential Properties with a Meter) – water service charge based on Meter size				
20mm	66.89	79.85 x (1+ΔCPI$_1$)	91.17 x (1+ΔCPI$_2$)	104.62 x (1+ΔCPI$_3$)
25mm	104.53	124.79 x (1+ΔCPI$_1$)	142.48 x (1+ΔCPI$_2$)	163.50 x (1+ΔCPI$_3$)
30mm	150.52	179.69 x (1+ΔCPI$_1$)	205.17 x (1+ΔCPI$_2$)	235.43 x (1+ΔCPI$_3$)
32mm	171.27	204.46 x (1+ΔCPI$_1$)	233.45 x (1+ΔCPI$_2$)	267.88 x (1+ΔCPI$_3$)
40mm	267.60	319.45 x (1+ΔCPI$_1$)	364.75 x (1+ΔCPI$_2$)	418.54 x (1+ΔCPI$_3$)
50mm	418.15	499.17 x (1+ΔCPI$_1$)	569.95 x (1+ΔCPI$_2$)	654.01 x (1+ΔCPI$_3$)
65mm	706.64	843.57 x (1+ΔCPI$_1$)	963.19 x (1+ΔCPI$_2$)	1,105.24 x (1+ΔCPI$_3$)
80mm	1,070.44	1,277.85 x (1+ΔCPI$_1$)	1,459.06 x (1+ΔCPI$_2$)	1,674.23 x (1+ΔCPI$_3$)
100mm	1,672.55	1,996.63 x (1+ΔCPI$_1$)	2,279.76 x (1+ΔCPI$_2$)	2,615.97 x (1+ΔCPI$_3$)
150mm	3,763.25	4,492.44 x (1+ΔCPI$_1$)	5,129.49 x (1+ΔCPI$_2$)	5,885.97 x (1+ΔCPI$_3$)
200mm	6,690.24	7,986.57 x (1+ΔCPI$_1$)	9,119.11 x (1+ΔCPI$_2$)	10,463.97 x (1+ΔCPI$_3$)
For Meter sizes not specified above, the following formula applies		(Meter size)^2 x 20mm charge/400		

Table 2 Water usage charge for Filtered Water to Metered Properties

Charge	Commencement Date to 30 June 2009 ($/kL)	1 July 2009 to 30 June 2010 ($/kL)	1 July 2010 to 30 June 2011 ($/kL)	1 July 2011 to 30 June 2012 ($/kL)
Tier 1 water usage charge	1.59	1.78 x (1+ΔCPI_1)	1.88 x (1+ΔCPI_2)	1.89 x (1+ΔCPI_3)
Tier 2 water usage charge	1.83	1.78 x (1+ΔCPI_1)	1.88 x (1+ΔCPI_2)	1.89 x (1+ΔCPI_3)

Table 3 Water usage charges for Unfiltered Water to Metered Properties

Charge	Commencement Date to 30 June 2009 ($/kL)	1 July 2009 to 30 June 2010 ($/kL)	1 July 2010 to 30 June 2011 ($/kL)	1 July 2011 to 30 June 2012 ($/kL)
Unfiltered Water – water usage charge	1.29	1.48 x (1+ΔCPI_1)	1.58 x (1+ΔCPI_2)	1.59 x (1+ΔCPI_3)

Table 4 Water service charge for Unmetered Residential Properties

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Water service charge	384.89	435.85 x (1+ΔCPI_1)	467.17 x (1+ΔCPI_2)	482.62 x (1+ΔCPI_3)

Table 5 Water service charge for Unmetered Non-Residential Properties

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Water service charge	257.69	293.45 x (1+ΔCPI_1)	316.77 x (1+ΔCPI_2)	331.42 x (1+ΔCPI_3)

Schedule 2 – Sewerage services

1. Application

This schedule sets the maximum prices that the Corporation may charge for services under paragraph (b) of the Order (sewerage services), (other than those set out in schedule 7).

2. Categories for pricing purposes

Prices for sewerage services have been determined for 5 categories:

(a) Residential Properties connected to the Sewerage System;

(b) Non Residential Properties connected to the Sewerage System;

(c) Properties not connected to the Sewerage System;

(d) Blue Mountains septic pump out services; and

(e) Exempt Land connected to the Sewerage System.

3. Charges for sewerage services to Residential Properties

The maximum price that may be levied by the Corporation for sewerage services to a Residential Property connected to the Sewerage System for a Billing Cycle is:

$$\frac{SC}{q}$$

Where:

SC = the sewerage service charge in Table 6 corresponding to the applicable Period in that table; and

q = the number of quarters in that Period.

4. Charges for sewerage services to Non Residential Properties

4.1 The maximum price that may be levied by the Corporation for sewerage services to a Non Residential Property that is connected to the Sewerage System for a Billing Cycle is the sum of the following:

(a) the sewerage service charge equal to the higher of:

(i) the sewerage service charge calculated as follows:

$$\frac{SC}{q} \text{ x DF}$$

Where:

SC = the sewerage service charge in Table 7 corresponding to the applicable Period and Meter size in that table;

q = the number of quarters in that Period; and

DF = the relevant Discharge Factor; and

(ii) the sewerage service charge calculated as follows:

$$\frac{SC_{cl4.2}}{q} \text{ x } DF_{100\%}$$

Where:

$SC_{cl4.2}$ = the sewerage service charge calculated under clause 4.2 of this schedule;

q = the number of quarters in that Period; and

$DF_{100\%}$ = a Discharge Factor of 100%; and

(b) the sewerage usage charge calculated as follows:

$$\left[\left(W \quad x \quad DF\right) \quad - \quad DA\right] \quad x \quad UC$$

Where:

W = the water used (in kL) by that Non Residential Property for the Meter Reading Period;

DF = the Discharge Factor for that Non Residential Property;

DA = the Discharge Allowance for that Non Residential Property;

UC = the sewerage usage charge in Table 8 for the Meter Reading Period (corresponding to the applicable Period in that table and the volume of sewage discharged); and

volume of sewage discharged means the resulting volume determined by multiplying W and DF in this clause 4.1(b).

Where (W x DF) is less than DA, the sewerage usage charge will be zero.

4.2 For the purposes of clause 4.1(a) of this schedule, if a Non Residential Property:

(a) has a resulting charge that is less than a charge for a 20mm Meter with a Discharge Factor of 100%; or

(b) does not have a Meter,

then the sewerage service charge levied on that Non Residential Property is taken to be a sewerage service charge for a Meter size of 20mm and a Discharge Factor of 100%.

5. Charges for sewerage services to Properties not connected to the Sewerage System

The maximum price that may be levied by the Corporation for sewerage services (other than the Blue Mountains Septic Services) to a Property not connected to the Sewerage System is zero for the period from the Commencement Date until the date that this determination ceases to apply.

6. Charges for Blue Mountains Septic Services

The maximum price that may be levied by the Corporation for Blue Mountains Septic Services for a Billing Cycle is the sum of the following:

(a) the septic pump out service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the septic pump out service charge in Table 9 corresponding to the applicable Period in that table;

q = the number of quarters in that Period; and

(b) the septic pump out usage charge in Table 10, multiplied by each kL of effluent removed, for the Meter Reading Period corresponding to the applicable Period in that table.

7. Charges for sewerage services to Exempt Land

The maximum price that may be levied by the Corporation for sewerage services to Exempt Land that is connected to the Sewerage System is the charge per water closet or urinal closet in Table 11, corresponding to the applicable Period in that table.

8. Levying sewerage service charges on Multi Premises

8.1 Sewerage service charges on Multi Premises

(1) Clause 8 of this schedule prescribes how the maximum prices in this schedule are to be levied on Multi Premises, specifically how they are to be levied on persons who own, control or occupy those Multi Premises.

(2) Clauses 3 and 4 of this schedule do not apply to Properties connected to the Sewerage System if this clause 8 is capable of applying to those Properties.

8.2 Strata Title Building (Residential Property)

(1) For a Strata Title Building:

(a) which is connected to the Sewerage System; and

(b) which has a Common Water Meter or multiple Common Water Meters, or is not serviced by a Meter; and

(c) where the majority of the Strata Title Lots (within that Strata Title Building) are Residential Properties,

the maximum price that may be levied by the Corporation for the provision of sewerage services for a Billing Cycle is:

$$\frac{SC}{q}$$

Where:

SC = the sewerage service charge in Table 12 corresponding to the applicable Period in that table; and

q = the number of quarters in that Period,

(**Residential Strata Sewerage Service Charge**).

(2) The Residential Strata Sewerage Service Charge is to be levied on each Strata Title Lot.

8.3 Strata Title Building (Non Residential Property)

(1) For a Strata Title Building:

(a) which is connected to the Sewerage System; and

(b) which has a Common Water Meter or multiple Common Water Meters or is not serviced by a Meter; and

(c) where the majority of the Strata Title Lots (within that Strata Title Building) are Non Residential Properties,

the maximum price that may be levied by the Corporation for the provision of sewerage services for a Billing Cycle is:

(d) the sewerage service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the sewerage service charge in Table 12 (corresponding to the applicable Period in that table); and

q = the number of quarters in that Period; and

(**Non Residential Strata Sewerage Service Charge**); and

(e) the sewerage usage charge calculated as follows:

$$\left[\left(W \quad x \quad DF\right) \quad - \quad DA\right] \quad x \quad UC$$

(the resulting amount being the **Strata Sewerage Usage Charge**)

Where:

W = the water used (in kL) by that Strata Title Building;

DF = the Discharge Factor for that Strata Title Building;

DA = the Discharge Allowance determined in accordance with clause 8.3.4;

UC = the sewerage usage charge in Table 8 for the Meter Reading Period (corresponding to the applicable Period in that table and the volume of sewage discharged); and

volume of sewage discharged means the resulting volume determined by multiplying W and DF in this clause 8.3.1(e).

Where (W x DF) is less than DA, the sewerage usage charge will be zero.

(2) The Non Residential Strata Sewerage Service Charge is to be levied on each Strata Title Lot.

(3) The Strata Sewerage Usage Charge is to be levied on the Owners Corporation of that Strata Title Building.

(4) For the purpose of clause 8.3.1(e), the 'Discharge Allowance' in Table 8 is increased by multiplying the Discharge Allowance by the number of Strata Title Lots in that Strata Title Building.

8.4 Multi Premises (Residential Property) other than a Strata Title Building

For a Multi Premises (which is not a Strata Title Building) and:

(a) which is connected to the Sewerage System; and

(b) which has a Common Water Meter or multiple Common Water Meters or is not serviced by a Meter; and

(c) where the majority of the Properties within that Multi Premises are Residential Properties,

the maximum price that may be levied by the Corporation on the owner of that Multi Premises for the provision of sewerage services to that Multi Premises for a Billing Cycle is the sewerage service charge calculated as follows:

$$\frac{SC}{q} \; x \; n$$

Where:

SC = the sewerage service charge in Table 12 corresponding to the applicable Period in that table;

n = the number of Properties within that Multi Premises; and

q = the number of quarters in that Period.

8.5 Multi Premises (Non Residential Property) other than a Strata Title Building

For a Multi Premises (which is not a Strata Title Building) and:

(a) which is connected to the Sewerage System; and

(b) which has a Common Water Meter or multiple Common Water Meters or is not serviced by a Meter; and

(c) where the majority of the Properties within that Multi Premises are Non Residential Properties,

the maximum price that may be levied by the Corporation on the owner of that Multi Premises for the provision of sewerage services to that Multi Premises for a Billing Cycle is the sum of the following:

(d) the sewerage service charge equal to the higher of:

(i) the sewerage service charge calculated as follows:

$$\frac{SC}{q} \text{ x DF}$$

Where:

SC = the sewerage service charge in Table 7 for each Common Water Meter corresponding to the applicable Period and Meter size in that table;

q = the number of quarters in that Period; and

DF = the relevant Discharge Factor; and

(ii) the sewerage service charge calculated as follows:

$$\frac{SC_{cl8.6}}{q} \text{ x } DF_{100\%}$$

Where:

$\mathbf{SC_{cl8.6}}$ = the sewerage service charge calculated under clause 8.6 of this schedule;

q = the number of quarters in that Period; and

$\mathbf{DF_{100\%}}$ = a Discharge Factor of 100%; and

(e) the sewerage usage charge calculated as follows:

$$\left[\left(W \quad x \quad DF\right) \quad - \quad DA\right] \quad x \quad UC$$

Where:

W = the water used (in kL) by that Multi Premises;

DF = the Discharge Factor for that Multi Premises;

DA = the Discharge Allowance for that Multi Premises;

UC = the sewerage usage charge in Table 8 for the Meter Reading Period corresponding to the applicable Period in that table and the volume of sewage discharged; and

volume of sewage discharged means the resulting volume determined by multiplying W and DF in this clause 8.5(e).

Where (W x DF) is less than DA, the sewerage usage charge will be zero.

8.6 For the purposes of clause 8.5(d) of this schedule, if a Multi Premises:

(a) has a resulting charge that is less than a charge for a 20mm Meter with a Discharge Factor of 100%; or

(b) does not have a Meter,

then the sewerage service charge levied on that Multi Premises is taken to be a sewerage service charge for a Meter size of 20mm and a Discharge Factor of 100%.

Tables 6, 7, 8, 9, 10, 11 and 12

Table 6 Sewerage service charge for Residential Properties

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Sewerage service charge – Residential Properties	468.68	470.24 x $(1+\Delta CPI_1)$	475.91 x $(1+\Delta CPI_2)$	482.16 x $(1+\Delta CPI_3)$

Table 7 Sewerage service charge for Non Residential Properties

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Meter size				
20mm	468.68	470.24 x $(1+\Delta CPI_1)$	475.91 x $(1+\Delta CPI_2)$	482.16 x $(1+\Delta CPI_3)$
25mm	732.33	734.76 x $(1+\Delta CPI_1)$	743.61 x $(1+\Delta CPI_2)$	753.38 x $(1+\Delta CPI_3)$
30mm	1,054.55	1,058.05 x $(1+\Delta CPI_1)$	1,070.80 x $(1+\Delta CPI_2)$	1,084.87 x $(1+\Delta CPI_3)$
32mm	1,199.84	1,203.82 x $(1+\Delta CPI_1)$	1,218.33 x $(1+\Delta CPI_2)$	1,234.33 x $(1+\Delta CPI_3)$
40mm	1,874.75	1,880.98 x $(1+\Delta CPI_1)$	1,903.63 x $(1+\Delta CPI_2)$	1,928.65 x $(1+\Delta CPI_3)$
50mm	2,929.30	2,939.04 x $(1+\Delta CPI_1)$	2,974.44 x $(1+\Delta CPI_2)$	3,013.52 x $(1+\Delta CPI_3)$
65mm	4,950.52	4,966.97 x $(1+\Delta CPI_1)$	5,026.81 x $(1+\Delta CPI_2)$	5,092.86 x $(1+\Delta CPI_3)$
80mm	7,499.03	7,523.95 x $(1+\Delta CPI_1)$	7,614.59 x $(1+\Delta CPI_2)$	7,714.63 x $(1+\Delta CPI_3)$
100mm	11,717.23	11,756.16 x $(1+\Delta CPI_1)$	11,897.78 x $(1+\Delta CPI_2)$	12,054.11 x $(1+\Delta CPI_3)$
150mm	26,363.77	26,451.37 x $(1+\Delta CPI_1)$	26,770.02 x $(1+\Delta CPI_2)$	27,121.75 x $(1+\Delta CPI_3)$
200mm	46,868.91	47,024.66 x $(1+\Delta CPI_1)$	47,591.15 x $(1+\Delta CPI_2)$	48,216.43 x $(1+\Delta CPI_3)$
For Meter sizes not specified above, the following formula applies		$(\text{Meter size})^2$ x 20mm charge/400		

Note: The prices in Table 7 assume the application of a Discharge Factor of 100%. The relevant Discharge Factor may vary from case to case, as determined by the Corporation. A pro rata adjustment shall be made where the df% is less than 100%.

Table 8 Sewerage usage charge for Non Residential Properties

Charge	Commencement Date to 30 June 2009 ($/kL)	1 July 2009 to 30 June 2010 ($/kL)	1 July 2010 to 30 June 2011 ($/kL)	1 July 2011 to 30 June 2012 ($/kL)
Sewerage usage charge				
volume of sewage discharged ≤ Discharge Allowance	0	0	0	0
volume of sewage discharged > Discharge Allowance	1.34	1.34 x (1+ΔCPI_1)	1.34 x (1+ΔCPI_2)	1.34 x (1+ΔCPI_3)

Note: Please refer to the relevant clause 4.1(b) or clause 8.3.1(e) or clause 8.5(e) for the calculation of ''volume of sewage discharged'.

Table 9 Blue Mountains Septic Pump Out service charge

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Septic pump out service charge	561.67	561.67 x (1+ΔCPI_1)	561.67 x (1+ΔCPI_2)	561.67 x (1+ΔCPI_3)

Table 10 Blue Mountains Septic Pump Out usage charge

Charge	Commencement Date to 30 June 2009 ($/kL)	1 July 2009 to 30 June 2010 ($/kL)	1 July 2010 to 30 June 2011 ($/kL)	1 July 2011 to 30 June 2012 ($/kL)
Septic pump out usage charge ≤100kL of effluent removed per annum	0	0	0	0
Septic pump out usage charge >100kL of effluent removed per annum	13.49	13.49 x (1+ΔCPI_1)	13.49 x (1+ΔCPI_2)	13.49 x (1+ΔCPI_3)

Table 11 Sewerage charge for Exempt Land

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Per water closet or urinal closet	90.38	90.38 x $(1+\Delta CPI_1)$	90.38 x $(1+\Delta CPI_2)$	90.38 x $(1+\Delta CPI_3)$

Table 12 Sewerage service charge to a Multi Premises with a Common Water Meter or not serviced by a Meter

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Sewerage service charge	468.68	470.24 x $(1+\Delta CPI_1)$	475.91 x $(1+\Delta CPI_2)$	482.16 x $(1+\Delta CPI_3)$

Schedule 3 – Stormwater drainage services

1. Application

1.1 This schedule sets the maximum prices that the Corporation may charge for services under paragraph (c) of the Order (stormwater drainage services).

1.2 Clauses 3 and 4 of this schedule do not apply to Properties if clause 5 is capable of applying to those Properties and is so applied.

2. Categories for pricing purposes

Prices for stormwater drainage services have been determined for 2 categories:

(a) Residential Properties and Vacant Land; and

(b) Non Residential Properties,

that are within a Stormwater Drainage Area.

3. Charges for stormwater drainage to Residential Properties and Vacant Land

The maximum price that may be levied by the Corporation for stormwater drainage services to a Residential Property or Vacant Land, (each within a Stormwater Drainage Area) for a Billing Cycle is:

$$\frac{SC}{q}$$

Where:

SC = the stormwater drainage service charge in Table 13, corresponding to the applicable Period in that table; and

q = the number of quarters in that Period.

4. Charges for stormwater drainage to Non Residential Properties

The maximum price that may be levied by the Corporation for stormwater drainage services to a Non Residential Property that is within a Stormwater Drainage Area for a Billing Cycle is:

$$\frac{SC}{q}$$

Where:

SC = the stormwater drainage service charge in Table 14, corresponding to the applicable Period in that table; and

q = the number of quarters in that Period.

5. Multi Premises which is not a Strata Title Building, Company Title Building or Community Parcel

For a Multi Premises which:

(a) is not a Strata Title Building, a Company Title Building or a Community Parcel; and

(b) is within a Stormwater Drainage Area,

the maximum price that may be levied by the Corporation on the owner of that Multi Premises for stormwater drainage services for a Billing Cycle is the sum of the following:

(1) **for all the Non Residential Properties** within that Multi Premises:

$$\frac{SC}{q}$$

Where:

SC = the stormwater drainage service charge in Table 14 corresponding to the applicable Period in that table; and

q = the number of quarters in that Period; and

(2) **for all the Residential Properties** within that Multi Premises:

$$\frac{SC}{q} \text{ x } n$$

Where:

SC = the stormwater drainage service charge in Table 13 corresponding to the applicable Period in that table;

q = the number of quarters in that Period; and

n = the total number of Residential Properties within that Multi Premises.

Tables 13 and 14

Table 13 Stormwater drainage service charge for Residential Properties and Vacant

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Stormwater drainage service charge	45.21	45.21 x $(1+\Delta CPI_1)$	45.21 x $(1+\Delta CPI_2)$	45.21 x $(1+\Delta CPI_3)$

Table 14 Stormwater drainage service charge for Non Residential Properties

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Stormwater drainage service charge	117.66	117.66 x $(1+\Delta CPI_1)$	117.66 x $(1+\Delta CPI_2)$	117.66 x $(1+\Delta CPI_3)$

Schedule 4 - Rouse Hill Development Area

1. Categories for pricing purposes

1.1 This schedule sets the maximum prices that the Corporation may charge the Properties in the Rouse Hill Development Area for services under paragraph (g) of the Order, specifically Recycled Water services.

1.2 The maximum prices in this schedule are in addition to the prices applying to the Properties in the Rouse Hill Development Area under schedules 1, 2, 3, 5, 6 and 7.

2. Categories for pricing purposes

The prices in this schedule have been determined only for Properties in the Rouse Hill Development Area.

3. Charges to Properties in the Rouse Hill Development Area.

The maximum price that may be levied by the Corporation for the provision of Recycled Water and drainage services to the Properties in the Rouse Hill Development Area for a Billing Cycle is the sum of the following:

(a) the Recycled Water service charge calculated as follows:

$$\frac{SC}{q}$$

Where:

SC = the Recycled Water service charge in Table 15, corresponding to the applicable Meter size and Period in that table; and

q = the number of quarters in that Period; and

(b) the Recycled Water usage charge in Table 16 multiplied by each kL of Recycled Water used for the Meter Reading Period, corresponding to the applicable Period in that table;

(c) the river management charge (drainage) calculated as follows:

$$\frac{RMC}{q}$$

Where:

RMC = the river management charge (drainage) in Table 17, corresponding to the applicable Period and the relevant land size in that table; and

q = the number of quarters in that Period.

Tables 15, 16 and 17

Table 15 Recycled Water service charge

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
Recycled Water service charge – Meter size				
20mm	19.36	19.36 x (1+ΔCPI$_1$)	19.36 x (1+ΔCPI$_2$)	19.36 x (1+ΔCPI$_3$)
For properties with Meter size >20mm the formula to apply is	(nominal diameter)^2 x (charge for 20mm Meter)/400			

Table 16 Recycled Water usage charge

Charge	Commencement Date to 30 June 2009 ($/kL)	1 July 2009 to 30 June 2010 ($/kL)	1 July 2010 to 30 June 2011 ($/kL)	1 July 2011 to 30 June 2012 ($/kL)
Recycled Water usage charge	1.27	1.42 x (1+ΔCPI$_1$)	1.50 x (1+ΔCPI$_2$)	1.51 x (1+ΔCPI$_3$)

Table 17 River management charge (drainage)

Charge	Commencement Date to 30 June 2009 ($)	1 July 2009 to 30 June 2010 ($)	1 July 2010 to 30 June 2011 ($)	1 July 2011 to 30 June 2012 ($)
River management charge (drainage)				
Non Residential Properties with land size ≤ 1000m2 and Residential Properties	118.44	118.44 x (1+ΔCPI$_1$)	118.44 x (1+ΔCPI$_2$)	118.44 x (1+ΔCPI$_3$)
Non Residential Properties with land size > 1000m2	118.44 x ((land area m^2)/1000)	118.44 x ((land area m^2)/1000) x (1+ΔCPI$_1$)	118.44 x ((land area m^2)/1000) x (1+ΔCPI$_1$)	118.44 x ((land area m^2)/1000) x (1+ΔCPI$_1$)

Schedule 5 – Trade waste services

1. Application

This schedule sets the maximum prices that the Corporation may charge for services under paragraph (d) of the Order (trade waste services).

2. Categories for pricing purposes

Prices for trade waste services have been determined for 2 categories:

(a) Industrial Customers that discharge trade waste into the Sewerage System; and

(b) Commercial Customers that discharge trade waste into the Sewerage System.

3. Charges for trade waste services to Industrial Customers

3.1 The maximum price that may be levied by the Corporation for trade waste services to Industrial Customers for each Billing Cycle is the sum of the following:

(a) **from the Commencement Date to 30 June 2009:**

(i) the industrial agreement charge in Table 18, corresponding to the applicable risk index determined by the Corporation; and

(ii) the charge in Table 19 and the charge corresponding to the threat level (determined by the Corporation) in Table 20 for the total mass of waste substances discharged that are in excess of the domestic equivalent for waste substance concentrations; and

(b) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the industrial agreement charge in Table 18, corresponding to the applicable risk index determined by the Corporation, as varied under clause 5 of this schedule; and

(ii) the charge in Table 19 and the charge corresponding to the threat level (determined by the Corporation) in Table 20 for the total mass of waste substances discharged that are in excess of the domestic equivalent for waste substance concentrations, as varied under clause 5 of this schedule.

3.2 For the purpose of clauses 3.1(a)(ii) and 3.1(b)(ii) of this schedule, a reference to "domestic equivalent for waste substance concentrations" is a reference to average concentrations of that substance over time and/or volume of discharge, determined in accordance with the Trade Waste Policy.

3.3 The maximum price that may be levied by the Corporation for the total waste substance concentrations in excess of the acceptance standard in Tables 19 and 20 is:

(a) **from the Commencement Date to 30 June 2009** - the corresponding charge in those tables; and

(b) **for each Period from 1 July 2009 to 30 June 2012** - the corresponding charge in those tables, as varied under clause 5 of this schedule,

doubled and applied to the entire mass of the substance discharged that is in excess of the domestic equivalent (rather than only to the amount that is in excess of the acceptance standard), excluding sulphate.

3.4 If the Corporation determines that a substance is either a critical substance or an over capacity substance, in accordance with the Trade Waste Policy, then:

(a) **from the Commencement Date to 30 June 2009** - the charges in Tables 19 and 20; and

(b) **for each Period from 1 July 2009 to 30 June 2012** - the charges in Tables 19 and 20, as varied under clause 5 of this schedule,

are to be multiplied by the charging rate multiplier in Table 21, and applied to so much of the mass of the substance that is 1.5 times in excess of the Industrial Customer's long term average daily mass (LTADM), as defined in the Corporation's Trade Waste Policy. This is in addition to the charges that apply to the mass of the substance that is equal to or less than the customer's LTADM.

3.5 For the avoidance of doubt, where applicable, both of clauses 3.3 and 3.4 of this schedule may apply to determine the charge payable for a particular substance.

4. Charges for trade waste services to Commercial Customers

4.1 The maximum price that may be levied by the Corporation for trade waste services to Commercial Customers is the sum of the following:

(a) **from the Commencement Date to 30 June 2009:**

(i) the commercial agreement charge in Table 22;

(ii) the volumetric charge equal to the higher of:

(A) the minimum annual charge in Table 23; and

(B) the volumetric charge in Table 23, corresponding to the applicable charging code determined in accordance with the Trade Waste Policy; and

(iii) the wastesafe charge in Table 24; and

(b) **for each Period from 1 July 2009 to 30 June 2012:**

(i) the commercial agreement charge as in Table 22, as varied under clause 5 of this schedule;

(ii) the volumetric charge equal to the higher of:

(A) the minimum annual charge in Table 23, as varied under clause 5 of this schedule; and

(B) the volumetric charge in Table 23, as varied under clause 5 of this schedule, corresponding to the applicable charging code determined in accordance with the Trade Waste Policy; and

(iii) the wastesafe charge in Table 24, as varied under clause 5 of this schedule.

5. Variation of charges

Each charge in Tables 18, 19, 20, 22, 23 and 24 (inclusive) is varied as follows:

(a) **from 1 July 2009 to 30 June 2010** - that charge is to be multiplied by $(1+\Delta CPI_1)$;

(b) **from 1 July 2010 to 30 June 2011** - that charge is to be multiplied by $(1+\Delta CPI_2)$; and

(c) **from 1 July 2011 to 30 June 2012** - that charge is to be multiplied by $(1+\Delta CPI_3)$.

Tables 18, 19, 20, 21, 22, 23 and 24

Table 18 Industrial agreement charge

Industrial agreement charge Commencement Date to 30 June 2009				
Risk Index	Standard ($ per quarter)	With direct electronic reporting (DER) ($ per quarter)	With on-line monitoring (OLM) ($ per quarter)	With DER and OLM ($ per quarter)
1	5,926.77	5,334.09	4,741.42	4,148.74
2	5,350.10	4,815.10	4,280.08	3,745.07
3	2,498.86	2,248.61	1,999.09	1,749.20
4	1,409.60	1,268.64	1,127.68	986.72
5	544.60	490.14	435.69	381.22
6	192.20	173.04	153.77	134.54
7	128.13	115.32	102.51	89.68

Table 19 Acceptance standards and quality charges for domestic substances

Substance	Acceptance standard (mg/L)	Domestic equivalent (mg/L)	Charges Commencement Date to 30 June 2009 ($/kg)
Suspended solids	600	200	0.817
BOD – to primary STP	See notes 2 and 3	230	0.114+[0.0169x (BOD mg/L) / 600]
BOD – to secondary/tertiary STP	See notes 2 and 3	230	0.644+[0.0169x (BOD mg/L) / 600]
Grease	Primary 110 Secondary/tertiary 200	50	1.152
Ammonia (as N)	100	35	1.910
Nitrogen (inland only)	150 See note 4	50	0.161
Phosphorus (inland only)	50 See note 4	10	1.277
Sulphate (SO_4)	2,000	50	0.126x[SO4 mg/L]/2000
Total dissolved solids (ocean systems, no discharge limitation)	10,000	450	0.0055
Total dissolved solids (inland systems and ocean systems, with discharge limitation)	Determined by system	450	0.0055
Total Dissolved Solids (inland and ocean systems, with advanced treatment to remove TDS)	Determined by system	450	0.165 x fraction of average dry weather flow treated

Note:

1. The mass of any substance (with the exception of sulphate ($S0_4$)) 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.

2. 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.

3. Acceptance standards for BOD 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.

4. 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 20 Threat level based on the acceptance standards and associated charges for non domestic substances

Threat level	Acceptance standard (mg/L)	Charge Commencement Date to 30 June 2009 ($/lg)
0	Provisional	0
1	10,000	0.005
2	5,000	0.01
3	1,000	0.07
4	500	0.12
5	300	0.23
6	100	0.65
7	50	1.27
8	30	2.12
9	20	3.17
10	10	6.41
11	5	12.80
12	3	21.13
13	2	32.00
14	1	64.07
15	0.5	128.14
16	0.1	640.70
17	0.05	1,281.46
18	0.03	2,114.37
19	0.01	6,406.90
20	0.005	12,813.79
21	0.0001	640,689.88

Table 21 Charges for critical substances over capacity substances

Substance status	Charging rate multiplier
Critical	2
Over capacity	3

Table 22 Commercial agreement charge

Charge	Commencement Date to 30 June 2009 ($/quarter)
Commercial agreement charge	
First process	19.20
Each additional process	6.40

Table 23 Volumetric charge for Commercial Customers

Charging code	Volumetric charge ($/kL)	Charging code	Volumetric charge ($/kL)
A	0.00	K	3.55
B	0.00	L	5.93
C	0.02	M	8.30
D	0.05	N	11.86
E	0.11	O	14.24
F	0.35	P	17.82
G	0.59	Q	23.74
H	0.82	R	35.61
I	1.18	S	59.35
J	2.36		
Where the volume of trade wastewater is assessed, a minium annual charge (all codes) of $64.47 applies			

Table 24 Wastesafe charge for Commercial Customers

Charge	Commencement Date to 30 June 2009 ($/kL)
Wastesafe charge	0.118

Schedule 6 – Ancillary and miscellaneous customer services

1. Application

This schedule sets the maximum prices that the Corporation may charge for services under paragraph (f) of the Order (ancillary and miscellaneous customer services for which no alternative supply exists).

2. Charges for ancillary and miscellaneous services

2.1 The maximum charge that may be levied by the Corporation for an ancillary and miscellaneous service in Table 25 is:

(a) **from the Commencement Date to 30 June 2009** - the corresponding charge in Table 25;

(b) **from 1 July 2009 to 30 June 2010** - the corresponding charge in Table 25 multiplied by $(1+\Delta CPI_1)$;

(c) **from 1 July 2010 to 30 June 2011** - the corresponding charge in Table 25 multiplied by $(1+\Delta CPI_2)$; and

(d) **from 1 July 2011 to 30 June 2012** - the corresponding charge in Table 25 multiplied by $(1+\Delta CPI_3)$.

2.2 A reference in Table 25 to "NA" means that the Corporation does not provide the relevant service.

Table 25 – Charges for ancillary and miscellaneous services

No.	Ancillary and miscellaneous services	Charges from Commencement Date to 30 June 2009 ($)
1	Conveyancing Certificate	
	a) Over the Counter	19.20
	b) Electronic	7.70
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	NA
	b) Uncertified	
	i. Over the Counter	22.00
	ii. Electronic	11.00
3	Service Location Diagram	
	(Location of sewer and/or Water Mains in relation to a property's boundaries)	
	a) Over the Counter	22.00
	b) Electronic	11.00
4	Special Meter Reading Statement	28.50
5	Billing Record Search Statement – up to and including 5 years.	36.00
6	Building over or Adjacent to Sewer Advice	32.00
	(Statement of Approval Status for existing Building Over or Adjacent to a Sewer)	
7	Water Reconnection	
	a) During business hours	33.00
	b) Outside business hours (if requested)	147.00
8	Workshop Test of Water Meter	
	(Removal and full mechanical test of the meter by an accredited	

No.	Ancillary and miscellaneous services	Charges from Commencement Date to 30 June 2009 ($)
	organisation at the customer's request to determine the accuracy of the water meter. This involves dismantling and inspection of meter components)	
	20mm	181.50
	25mm	181.50
	32mm	181.50
	40mm	181.50
	50mm	181.50
	60mm	NA
	80mm	181.50
	100mm	NA
	150mm	NA
	Strip test	
	20mm	NA
	>20mm	NA
9	Water main disconnection	
	a) Application for Disconnection-(all sizes)	79.00
	b) Physical Disconnection	NA
10	Application for Water Service Connection-(up to and including 25mm)	38.50
	(This covers the administration fee only. There will be a separate charge payable to the utility if they also perform the physical connection)	
11	Application for Water Service Connection-(32-65mm)	248.00
	(This covers administration and system capacity analysis as required)	
12	Application for Water Service Connection-(80mm or greater)	270.00
	(This covers administration and system capacity analysis as required)	
13	Application to assess a Water main Adjustment	
	(Moving a fitting and/or adjusting a section of water main up to and including 25 metres in length)	
	This covers preliminary advice as to the feasibility of the project and will result in either:	
	1. A rejection of the project in which cases the fee covers the associated investigation costs	NA

No.	Ancillary and miscellaneous services	Charges from Commencement Date to 30 June 2009 ($)
	Or	
	2. Conditional approval in which case the fee covers the administrative costs associated with the investigation and record amendment.	NA
14	Standpipe Hire	
	Security Bond (25mm)	NA
	Security Bond (63mm)	NA
15	Standpipe Hire	
	Annual Fee	see meter size price for Metered Non Residential Properties in table 1 of schedule 1
	(20mm)	
	(32mm)	
	(50mm)	
	Quarterly Fee	
	(20mm)	NA
	(32mm)	NA
	(50mm)	NA
	Monthly Fee	
	(20mm)	NA
	(32mm)	NA
	(50mm)	NA
	Tri-annual Fee	
	(20mm)	NA
	(32mm)	NA
	(50mm)	NA
16	Standpipe Water Usage Fee	see water usage price in table 2 of schedule 1
17	Backflow Prevention Device Application and Registration Fee (This fee is for initial registration of the backflow device)	NA
18	Backflow Prevention Application Device Annual Administration Fee (This fee is for the maintenance of records including logging of inspection reports)	NA

Table 25 – Charges for ancillary and miscellaneous services

No.	Ancillary and miscellaneous services	Charges from Commencement Date to 30 June 2009 ($)
19	Major Works Inspections Fee.	
	(This fee is for the inspection, for the purposes of approval of water and sewer mains, constructed by others, that are longer than 25 metres and/or greater than 2 metres in depth)	
	Water Mains ($ per Metre)	NA
	Gravity Sewer Mains ($per Metre)	NA
	Rising Sewer Mains ($per Metre)	NA
	Reinspection	
20	Statement of Available Pressure and Flow	175.00

No.	Ancillary and miscellaneous services	Commencement Date to 30 June 2009	
		Fixed charges ($)	Hourly charges ($)
21	Diagram Discrepancy – known as HS85 Application for Sydney Water to undertake a Property Sewerage Diagram estimation for a property where no diagram currently exists	143.00	NA
22	Request for Asset Construction Details Detailed map of Sydney Water assets indicating water, sewer and drainage.	77.00	NA
23	Sydney Water Supply System Diagram Large Hydra Plan showing water, sewer and drainage assets, covering a large area in a single plot.	33.00	115.00 plus 1.10 per lot for water, 1.37 for water and sewerage.
24	Building Plan Approval Approval of building/development plans certifying that the proposed construction does not adversely impact on Sydney Water's assets.	25.00	NA
25	Water main Adjustment Application Application for Sydney Water to investigate the feasibility of relocating or adjusting an existing water main.	171.00	NA

No.	Ancillary and miscellaneous services	Commencement Date to 30 June 2009	
		Fixed charges ($)	Hourly charges ($)
26	Water main Fitting Adjustment Application Application for an Accredited Supplier to lower or raise an existing water main fitting.	112.00	NA
27	Pump Application – Water Application for approval of an installation of a pump on the domestic or fire service, serving a property.	144.00	NA
28	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.	111.00	NA
29	Sewer Junction Connection Application Application for an Accredited Supplier to insert a junction into Sydney Water's sewer line.	133.00	NA
30	Sewer Sideline Connection Application Application for an Accredited Supplier to extend a junction to provide a suitable point of connection.	133.00	NA
31	Sewer main Adjustment Application Application for Sydney Water to investigate the feasibility of relocating or adjusting a sewer main.	171.00	NA
32	Vent Shaft 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.	234.00	NA
33	Disuse of Sewer Application Application for a Sydney Water to investigate the feasibility to disuse an existing Sydney Water sewer.	147.00	NA
34(a)	Plumbing and Drainage Inspection Application Application for Sydney Water to inspect any new sewer or drainage connections. This includes the drawing up of property sewerage diagrams on completion.	65.00	NA
34(b)	Plumbing and Drainage Inspection Fee	79.00	NA

Table 25 – Charges for ancillary and miscellaneous services

No.	Ancillary and miscellaneous services	Commencement Date to 30 June 2009	
		Fixed charges ($)	Hourly charges ($)
	Fee per inspection for Sydney Water to inspect any new sewer or drainage connections. NB: Application fee also applies.		
34 (c)	Plumbing and Drainage Re -inspection Fee Fee per re-inspection for Sydney Water to inspect any sewer or drainage connections. NB: Application fee does not apply.	79.00	NA
35	Connection to Stormwater Channel Approval Application Application for approval to connect to Sydney Water's stormwater channel greater than 300mm.	280.00	NA
36	Inspection of Break In Stormwater Channel Application Application for an inspection of a connection to Sydney Water's stormwater channel greater than 300mm	224.00	NA
37	Inspection of Drainage Lines Application Application for an inspection of drainage lines from stormwater connection to silt arrestor and updating of records.	123.00	NA
38	Review of Hydraulic Plans Application for Sydney Water to examine hydraulic drawings to determine if internal drainage meets plumbing regulations. Water and fire hydraulics to be submitted and examined individually.	47.00	115.00
39(a)	Subdivider/Developer Compliance Certificate (also known as a 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.	357.00	NA
39(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.	357.00	NA

No.	Ancillary and miscellaneous services	Commencement Date to 30 June 2009	
		Fixed charges ($)	Hourly charges ($)
39(c)	Road Closure Application Lodgement of an application for a permanent road closure. Formerly included in subdivider development application	216.00	NA
40	Developer Investigation Fee Investigation of expanding reticulation systems to cater for developments requirements and to safeguard Sydney Water's assets.	see service 39	115.00
41	Design and Construct Contract Administration Performance of various activities to ensure the quality of the work under contract during the development and to safeguard Sydney Water's assets.	NA	115.00
42	Minor Extension Approval Application (changed name to Water and Sewer Extension Application) Application for approval to undertake a minor extension of an existing service or for expanding reticulation systems for a development.	197.00	NA
43	Hydrant Resealing Charge levied on the property owner to reseal a fire hydrant to prevent illegal use of unmetered water.	19.00	NA
44	Dishonoured or Declined Payment Fee Fee for dishonoured reversal/payment processing where a financial institute declined a payment to Sydney Water.	20.00	NA
45(a)	Cancellation of Plumbers Permit Application for Sydney Water to cancel a plumber's permit where both parties sign the application	NA	NA
45(b)	Cancellation of Plumbers Permit Application for Sydney Water to cancel a plumber's permit where only one signatory is received.	57.00	NA
46	Plumbing and Drainage Quality Assurance Application New charge which is expected to be utilised when Sydney Water's Quality Assurance audit role becomes	164.00	NA

Table 25 – Charges for ancillary and miscellaneous services

No.	Ancillary and miscellaneous services	Commencement Date to 30 June 2009	
		Fixed charges ($)	Hourly charges ($)
	effective. With Sydney Water's Plumbing and Drainage inspectors moving towards a Quality Assurance role.		
47	Hourly Rate – Technical Services	NA	115.00
	Hourly rate for provision of expertise and technical services		
48(a)	Trade waste miscellaneous charges		
	Industrial and commercial trade waste inspections		
	- with one Sydney Water representative	NA	66.00
	- with two Sydney Water representative	NA	132.00
	Minimum increment	33.00	NA
48(b)	Trade waste application fees for industrial customers only		
	-Standard	263.00	NA
	- Non Standard – where an assessment of pollutants is not covered in the Corporation's Trade Waste Policy, that assessment will be charged at the standard hourly rate plus analytical costs incurred by the Corporation in assessing the wastewater to be discharged, up to a maximum of $20,000	NA	118.00
	- Variation	316.00	NA
48(c)	Product authorisation / assessment		
	Applicable to commercial customers only		
	- Application fee	237.00	NA
	- Assessment fee	NA	115.00
48(d)	Sale of trade waste data	NA	115.00
49	Alternative Water Inspection Fee	230.00	NA
	Alternative Water Inspection application for Sydney Water to review the proposed connection to an alternative water source i.e. bore water, grey water. This includes updating the sewerage service diagram on completion.		
50	Hourly Rate – Civil Maintenance	NA	82.00

Schedule 7 – Minor Service Extensions

1. Application

This schedule sets the maximum prices that the Corporation may charge for certain services under paragraph (a) of the Order (water supply services) and paragraph (b) of the Order (sewerage services).

2. Prices for minor service extensions

2.1 The maximum price that the Corporation may charge for the provision of water and sewerage services that constitute a Minor Service Extension is the price calculated under clause 3 of this schedule.

2.2 The price calculated under clause 3 of this schedule may only be levied by the Corporation on a Property after the Application Date corresponding to that Property.

3. Calculating the price

3.1 The maximum price for the services described in clause 2.1 of this schedule, when the Connection Date is the same as the Availability Date, is the price determined by the following formula:

$$P0 = \left[\frac{(PV(K) - PV(R - C))}{PV(S)} \right]$$

3.2 The maximum price for the services described in clause 2.1, when the Connection Date is within the Year following the Availability Date, is the price determined by the following formula:

$$P1 = P0 \times (\theta CPI_B)$$

3.3 The maximum price for the services described in clause 2.1 of this schedule, when clauses 3.1 and 3.2 of this schedule do not apply, is the price determined by the following formula:

$$Pt = P0 \times [(\theta CPI_A) \times \ldots \times (\theta CPI_B)]$$

3.4 In clauses 3.1, 3.2 and 3.3 of this schedule:

P0 is the price per Equivalent Tenament that the Corporation may levy under clause 2.2 of this schedule calculated on the Availability Date.

P1 is the price per Equivalent Tenament that the Corporation may levy under clause 2.2 of this schedule when the Connection Date is within the Year following the Availability Date.

Pt is the price per Equivalent Tenament that the Corporation may levy under clause 2.2 of this schedule when clauses 3.1 and 3.2 of this schedule do not apply.

PV means:

(a) when applied to K or (R-C) , the present value of K or (R-C) (as the case may be), applying a discount rate of 7 per cent;

(b) when applied to S, the present value of S (over the same period as that used to calculate R), applying a discount rate of 7 per cent.

K is the total capital cost of the Minor Service Extension to which this schedule applies.

R is the estimated future revenue to be derived in a given Year from the provision of a Minor Service Extension to the owners of the Properties capable of being connected to the Water Supply System or Sewerage System, following a Minor Service Extension.

C is the estimated future operating, maintenance and administration costs expected to be spent on customers serviced by the Minor Service Extension.

S is so much of Equivalent Tenament that the Corporation estimates is attributable to connections in each of the Years, following a Minor Service Extension.

Equivalent Tenament means a measure of the demand (as determined by the Corporation) that will be placed on its Water Supply System or Sewerage System by a Property being connected to those systems following a Minor Service Extension expressed as a unit of the additional demand placed on those systems above the demand placed by an average Residential Property (where 'average Residential Property" is determined by the Corporation from time to time).

Year means a period of twelve months commencing 1 July and ending on 30 June in the ensuing calendar year.

θCPI_A is:

(a) the sum of the CPIs for each of the four quarters in the Year immediately following the Availability Date

divided by

(b) the sum of the CPIs for each of the four quarters in the Year of the Availability Date.

θCPI_B is:

(a) the sum of the CPIs for each of the four quarters in the Year immediately preceding the Connection Date

divided by

(b) the sum of the CPIs for each of the four quarters in the Year immediately preceding the earliest quarter in paragraph (a).

"..." denotes:

(a) the number of Years between the Year following the Availability Date and the Connection Date; and

(b) that in each of the Years in paragraph (a) there is to be applied an index which is:

(i) the sum of the CPIs for each of the four quarters of that Year;

divided by

(ii) the sum of the CPIs for each of the four quarters of the Year immediately preceding the Year in paragraph (i).

3.5 For example, if the proposed Availability Date for a Property is January 2009, and the Connection Date for that Property is May 2012, the charge under clause 2.2 of this schedule is calculated by applying the formula in clause 3.3 of this schedule as follows:

$$P_{example} = \text{Connection price}_{2009} \times (\theta\text{CPI}_{2009}) \times (\theta\text{CPI}_{2010}) \times (\theta\text{CPI}_{2011})$$

Where:

$P_{example}$ means the price that may be levied by the Corporation in this example,

Connection price$_{2008}$ means the price for connection at the Availability Date, which is the amount derived from $\left[\frac{(PV(K) - PV(R-C))}{PV(S)}\right]$

$$\theta\text{CPI}_{2009} = \left(\frac{CPI_{Sept2008} + CPI_{Dec2008} + CPI_{Mar2009} + CPI_{Jun2009}}{CPI_{Sept2007} + CPI_{Dec2007} + CPI_{Mar2008} + CPI_{Jun2008}} \right)$$

$$\theta\text{CPI}_{2010} = \left(\frac{CPI_{Sept2009} + CPI_{Dec2009} + CPI_{Mar2010} + CPI_{Jun2010}}{CPI_{Sept2007} + CPI_{Dec2007} + CPI_{Mar2008} + CPI_{Jun2008}} \right)$$

$$\theta\text{CPI}_{2011} = \left(\frac{CPI_{Sept2010} + CPI_{Dec2010} + CPI_{Mar2011} + CPI_{Jun2011}}{CPI_{Sept2007} + CPI_{Dec2007} + CPI_{Mar2008} + CPI_{Jun2008}} \right)$$

The application of the formula in clause 3.3 of this schedule given the definitions in clause 3.4 results in $\theta\text{CPI}_{2007} = \theta\text{CPI}_{2008}$ in this example.

Assume in this example PV(S) is calculated in the following way:

The Corporation estimates that the total Equivalent Tenaments for the minor service extension is 20. S is so much of the 20 Equivalent Tenaments that the Corporation estimates is attributable to connections in each of the following Years.

If 10 Equivalent Tenaments were expected to connect to the system in the first Year it became available, 4 in the next and the remaining 6 in the third, then applying a discount rate of 7 per cent:

$$PV(S) = 10 + \frac{4}{1.07} + \frac{6}{1.07^2} \approx 18.99$$

Schedule 8 – Definitions and Interpretations

1. Definitions

1.1 General definitions

Application Date is the date on which a person applies in writing to the Corporation for a Minor Service Extension.

Availability Date is the date on which a Property is capable of being connected to the Water Supply System and/or Sewerage System, following a Minor Service Extension, irrespective of whether the Property is connected on that date.

Billing Cycle means each quarter during a Period.

Blue Mountains Septic Service means the service provided by the Corporation, of pumping out effluent from Properties with septic tanks, within the Blue Mountains City Council Area.

Commencement Date means the Commencement Date defined in clause 2 of section 2 (Application of this determination) of this determination.

Commercial Customer has the meaning given to that term in the Trade Waste Policy.

Common Water Meter means a Meter which is connected or available for connection to Multi Premises, where the Meter measures the water usage to that Multi Premises but not to each relevant Property located on or within that Multi Premises.

Community Development Lot has the meaning given to that term under the *Community Land Development Act 1989*.

Community Parcel has the meaning given to that term under the *Community Land Development Act 1989*.

Company Title Building means a building owned by a company where the issued shares of the company entitle the legal owner to exclusive occupation of a specified Company Title Dwelling within that building.

Company Title Dwelling means a dwelling within a Company Title Building.

Connection Date means the date on which a Property is connected to the Water Supply System and/or Sewerage System, following a Minor Service Extension.

Corporation means the Corporation as defined in clause 2 of section 1 (Background) of this determination, constituted under the Sydney Water Act 1994.

Determination No 5, 2005 means IPART's Determination No 5, 2005 entitled 'Sydney Water Corporation'.

Determination No 9, 2006 means IPART's Determination No 9, 2006 entitled 'Rouse Hill Recycled Water Charges'.

Discharge Allowance means 1.37kL per day multiplied by the number of days in the relevant Meter Reading Period.

df% or **Discharge Factor** means the ratio, expressed as a percentage, of the amount of waste water the Corporation determines is discharged from a Property into the Sewerage System, to the water, determined by a Meter, entering that Property.

Exempt Land means land described in part 1, schedule 2 of the *Sydney Water Act, 1994*.

Filtered Water means water that has been treated at a water filtration plant.

GST means the Goods and Services Tax as defined in *A New Tax System (Goods and Services Tax) Act, 1999*.

Industrial Customer has the meaning given to that term in the Trade Waste Policy.

IPART means the Independent Pricing and Regulatory Tribunal of New South Wales established under the IPART Act.

IPART Act means the *Independent Pricing and Regulatory Tribunal Act 1992.*

kL means kilolitre or one thousand litres.

Local Government Act means the *Local Government Act 1993 (NSW).*

Meter means an apparatus for the measurement of water.

Metered Non Residential Property means a Non Residential Property that is serviced by a Meter.

Metered Property means a Metered Residential Property or a Metered Non Residential Property.

Meter Reading Period means a period equal to the number of days between:

(a) the date on which the Meter was last read (or taken to have been read by the Corporation); and

(b) the date on which the Meter was read (or taken to have been read by the Corporation) immediately preceding the date in paragraph (a).

Metered Residential Property means a Residential Property that is serviced by a Meter.

Metered Standpipe means a metered device for connecting to the Water Supply System to enable water to be extracted.

Minor Service Extension means a service provided by the Corporation to extend the Sewerage System and/or the Water Supply System to Properties which are not connected to the Sewerage System and the Water Supply System and where the owners of those Properties (which are capable of being connected) request to be connected to the Sewerage System and/or the Water Supply System.

Monopoly Services means the Monopoly Services defined in clause 2 of section 1 (Background) of this determination.

Multi Premises means a premises where there are two or more Properties, excluding premises where there are hotels, motels, guest houses or backpacker hostels (each as defined in the Local Government Act) located on it.

Non Residential Property means a Property that is not a Residential Property or Vacant Land.

Order means the Order defined in clause 1(b) of section 1 (Background) of this determination and published in Government Gazette No. 18, on 14 February 1997.

Operating Licence means the Corporation's operating licence in force under part 5 of the *Sydney Water Act, 1994*.

Owners Corporation has the meaning given to that term under the *Strata Schemes Management Act 1996*.

Period means the Commencement Date to 30 June 2009, 1 July 2009 to 30 June 2010, 1 July 2010 to 30 June 2011 or 1 July 2011 to 30 June 2012 (as the case may be).

Property includes:

(a) a Strata Title Lot;

(b) a Company Title Dwelling;

(c) a Community Development Lot;

(d) a building or part of a building occupied or available for occupation; or

(e) land.

Rateable Land has the meaning given to that term under the Local Government Act.

Recycled Water means water that has been treated to enable its use for certain industrial, commercial, and/or household applications, but does not or is not intended to meet the standards for drinking water required by the National Health and Medical Research Council's Australian Drinking Water Guidelines.

Residential Property means a Property where:

(a) in the case of that Property being Rateable Land, that Property is categorised as residential under section 516 of the Local Government Act; or

(b) in the case of that Property not being Rateable Land, the dominant use of that Property is residential, applying the classifications in section 516 of the Local Government Act**.**

Rouse Hill Development Area means that area in the map bounded by the broken line in Attachment A excluding that area described as "Kellyville existing residential area" and the "cemetery".

SCA means the Sydney Catchment Authority.

Sewerage System means the sewerage system of the Corporation.

Stormwater Drainage Area has the meaning given to that term under the *Sydney Water Act 1994.*

Strata Title Building means a building that is subject to a strata scheme under the *Strata Schemes (Freehold Development) Act 1973.*

Strata Title Lot means a lot as defined under the *Strata Schemes (Freehold Development) Act 1973.*

Tier 1 Water Consumption means 1.096kL per day multiplied by the number of days in the relevant Meter Reading Period.

Trade Waste Policy means the Corporation's *Trade Waste Policy* (2007) as amended from time to time.

Unfiltered Water means water that has been chemically treated but not treated at a water filtration plant.

Unmetered Non Residential Property means a Non Residential Property that is not serviced by a Meter.

Unmetered Property means an Unmetered Residential Property or an Unmetered Non Residential Property.

Unmetered Residential Property means a Residential Property that is not serviced by a Meter

Vacant Land means land with no capital improvements and no connection to the Water Supply System.

Water Supply System means the water supply system of the Corporation.

1.2 Consumer Price Index

(a) CPI means the consumer price index All Groups index number for the weighted average of eight capital cities, published by the Australian Bureau of Statistics, or if the Australian Bureau of Statistics does not or ceases to publish the index, then CPI will mean an index determined by IPART

(b) $$\mathbf{\Delta CPI}_1 = \left(\frac{CPI_{Jun2008} + CPI_{Sep2008} + CPI_{Dec2008} + CPI_{Mar2009}}{CPI_{Jun2007} + CPI_{Sep2007} + CPI_{Dec2007} + CPI_{Mar2008}} \right) - 1$$

$$\mathbf{\Delta CPI}_2 = \left(\frac{CPI_{Jun2009} + CPI_{Sep2009} + CPI_{Dec2009} + CPI_{Mar2010}}{CPI_{Jun2007} + CPI_{Sep2007} + CPI_{Dec2007} + CPI_{Mar2008}} \right) - 1$$

$$\mathbf{\Delta CPI}_3 = \left(\frac{CPI_{Jun2010} + CPI_{Sep2010} + CPI_{Dec2010} + CPI_{Mar2011}}{CPI_{Jun2007} + CPI_{Sep2007} + CPI_{Dec2007} + CPI_{Mar2008}} \right) - 1$$

each as calculated by IPART and notified in writing by IPART to the Corporation.

(c) The subtext (for example $CPI_{Jun,year\ n}$) when used in relation to paragraph (b) above means the CPI for the June quarter and year in which the calculation was made and (for example, $CPI_{Jun\ year\ n-1}$) means the CPI for the June quarter in the year immediately preceding June, $year_n$.

1.3 Adjustment to service charges to reflect changes in the price of water supplied by the Sydney Catchment Authority to the Corporation

ΔP_{SCA}^{t} = the corresponding formula below for the relevant period, such that:

(a) for the period 1 July 2009 to 30 June 2010, $\Delta P_{SCA}^{t} = \Delta P_{SCA}^{2009/10}$;

(b) for the period 1 July 2010 to 30 June 2011, $\Delta P_{SCA}^{t} = \Delta P_{SCA}^{2010/11}$; and

(c) for the period 1 July 2011 to 30 June 2012, $\Delta P_{SCA}^{t} = \Delta P_{SCA}^{2011/12}$.

$$\Delta P_{SCA}^{2009/10} = \left(\frac{\left(P_{vSCA(2009/10)} \times ML_{a(2009/10)} + P_{fSCA(2009/10)}\right) - \left(P_{vSCA(2008/09)} \times ML_{d(2009/10)} + P_{fSCA(2008/09)}\right)}{20\,mmEq_{(2009/10)}} \right) \times \left(\frac{A^2}{400} \right)$$

$$\Delta P_{SCA}^{2010/11} = \left(\frac{\left(P_{vSCA(2010/11)} \times ML_{b(2010/11)} + P_{fSCA(2010/11)}\right) - \left(P_{vSCA(2008/09)} \times ML_{e(2010/11)} + P_{fSCA(2008/09)}\right)}{20\,mmEq_{(2010/11)}} \right) \times \left(\frac{A^2}{400} \right)$$

$$\Delta P_{SCA}^{2011/12} = \left(\frac{\left(P_{vSCA(2011/12)} \times ML_{c(2011/12)} + P_{fSCA(2011/12)}\right) - \left(P_{vSCA(2008/09)} \times ML_{f(2011/12)} + P_{fSCA(2008/09)}\right)}{20\,mmEq_{(2011/12)}} \right) \times \left(\frac{A^2}{400} \right)$$

Where

P_{vSCA} = the volumetric charge (per megalitre) which IPART determines that the SCA may charge the Corporation in the relevant period.[1]

P_{fSCA} = the fixed charge which IPART determines that the SCA may charge the Corporation in the relevant period.[2]

ML_a, ML_b *and* ML_c = IPART's estimate of the number of megalitres of water that the Corporation will purchase from the SCA in the relevant period. These are the following amounts:[3]

[1] IPART determined the volumetric charge for the SCA for the period from 1 July 2008 to 30 June 2009 in Determination No. 7 of 2005. IPART should issue a new determination in 2009 with values for the remaining periods from 1 July 2009 to 30 June 2012.

[2] IPART determined the fixed charge for the SCA for the period from 1 July 2008 to 30 June 2009 in Determination No. 7 of 2005. IPART should issue a new determination in 2009 with values for the remaining periods from 1 July 2009 to 30 June 2012.

$ML_{a\,(2009/10)}$ = IPART's estimate of the number of megalitres of water that the Corporation will purchase from the SCA for the period 1 July 2009 to 30 June 2010 (to be determined by IPART and notified in writing by IPART to the Corporation)

$ML_{b\,(2010/11)}$ = IPART's estimate of the number of megalitres of water that the Corporation will purchase from the SCA for the period 1 July 2010 to 30 June 2011 (to be determined by IPART and notified in writing by IPART to the Corporation)

$ML_{c\,(2011/12)}$ = IPART's estimate of the number of megalitres of water that the Corporation will purchase from the SCA for the period 1 July 2011 to 30 June 2012 (to be determined by IPART and notified in writing by IPART to the Corporation)

ML_d, ML_e and ML_f = As at the date of this determination, IPART's current estimate of the number of megalitres of water that the Corporation will purchase from the SCA in the relevant period. These have been determined as the following amounts:

$ML_{d\,(2009/10)}$ = 514,414

$ML_{e\,(2010/11)}$ = 452,832

$ML_{f\,(2011/12)}$ = 443,215

20mmEq = IPART's estimate of the number of 20mm equivalent water meters in the relevant period. These have been determined as the following amounts:

$20mmEq_{(2009/10)}$ = 1,631,715

$20mmEq_{(2010/11)}$ = 1,653,011

$20mmEq_{(2011/12)}$ = 1,674,264

A = the size of the water connection to the property in millimetres.

---

[3] IPART estimated the number of megalitres of water that the Corporation will purchase from the SCA for the period from 1 July 2008 to 30 June 2009 for its Report Nos. 5, 6 and 7, 2005 entitled *Sydney Water Corporation, Hunter Water Corporation, Sydney Catchment Authority – Prices of Water Supply, Wastewater and Stormwater Services*. IPART should issue a new report in relation to the SCA in 2009 with estimates for the remaining periods from 1 July 2009 to 30 June 2012.

1.4 A worked example of the adjustment to service charges to reflect changes in the price of water supplied by the Sydney Catchment Authority to the Corporation

Assume for the purpose of this worked example only that:

(a) the volumetric charge (per megalitre) which IPART determines that the SCA may charge the Corporation for the period 1 July 2011 to 30 June 2012 is $300/ML;

(b) the volumetric charge (per megalitre) which IPART determines that the SCA may charge the Corporation for the period 1 July 2008 to 30 June 2009 is $210/ML;

(c) the fixed charge which IPART determines that the SCA may charge the Corporation for the period 1 July 2011 to 30 June 2012 in 2011/12 is $62m;

(d) the fixed charge which IPART determines that the SCA may charge the Corporation for the period 1 July 2008 to 30 June 2009 is $54m;

(e) IPART's current estimate (as at the date of this determination) of the number of megalitres of water that the Corporation will purchase from the SCA for the period 1 July 2011 to 30 June 2012 is 443,215 mL;

(f) IPART's estimate (as determined by IPART and notified by IPART to the Corporation) of the number of megalitres of water that the Corporation will purchase from the SCA for the period 1 July 2011 to 30 June 2012 is 450,000 mL;

(g) IPART's estimate of the number of 20mm equivalent water meters for the period 1 July 2011 to 30 June 2012 is 1,674,264; and

(h) the property has a 30mm connection.

Then

$$\Delta P_{SCA}^{2011/12} =$$

$$\left(\frac{\left(P_{vSCA(2011/12)} \times ML_{c(2011/12)} + P_{fSCA(2011/12)}\right) - \left(P_{vSCA(2008/09)} \times ML_{f(2011/12)} + P_{fSCA(2008/09)}\right)}{20\,mmEq_{(2011/12)}}\right) \times \left(\frac{A^2}{400}\right)$$

and

$$\Delta P_{SCA}^{2011/12} = \left(\frac{\left(300 \times 450{,}000 + 62m\right) - \left(210 \times 443{,}215 + 54m\right)}{1{,}674{,}264}\right) \times \left(\frac{30^2}{400}\right)$$

therefore

$$\Delta P_{SCA}^{2011/12} = \$67.09$$

2. Interpretation

2.1 General provisions

In this determination:

(a) headings are for convenience only and do not affect the interpretation of this determination;

(b) a reference to a schedule, annexure, clause or table is a reference to a schedule, annexure, clause or table to this determination;

(c) words importing the singular include the plural and vice versa;

(d) a reference to a law or statute includes all amendments or replacements of that law or statute;

(e) a reference to a "quarter" is a reference to a consecutive period of three months ending on 31 March, 30 June, 30 September or 31 December, as the case may be;

(f) where a Period consists of less than four quarters, that Period is deemed to have four quarters for the purposes of calculating prices in this determination.

2.2 Explanatory notes, examples and clarification notice

(a) Explanatory notes and examples do not form part of this determination, but in the case of uncertainty may be relied on for interpretation purposes.

(b) IPART may publish a clarification notice in the NSW Government Gazette to correct any manifest error in or to clarify any part of this determination as if that clarification notice formed part of this determination.

2.3 Prices exclusive of GST

Prices or charges specified in this determination do not include GST.

2.4 Billing

(a) For the avoidance of doubt nothing in this determination affects when the Corporation may issue a bill to a customer for prices or charges under this determination.

(b) If a Meter Reading Period commences before the Commencement Date and ends after the Commencement Date, the water usage charge or sewerage usage charge applying to the whole of that Meter

Reading Period is the charge calculated under Determination No 5 of 2005 or Determination No 9 of 2006, prior to that determination being replaced by this determination.

(c) Subject to clause 2.4(b) above, if a Meter Reading Period traverses more than one Period, the Corporation must levy any charge applying in this determination on a pro-rata basis.

2.5 Apparatus for checking quantity of water used

For the purposes of this determination, where an apparatus is used by the Corporation to check on the quantity of water used recorded by a Meter, that apparatus will not fall within the definition of a 'Meter'.

Schedule 9 – Statement of reasons why the Tribunal has chosen to set a methodology for fixing a maximum price

Under section 13A of the IPART Act, the Tribunal may set maximum prices or may determine a methodology for setting maximum prices.

In this determination, the Tribunal has employed a methodology for fixing the maximum prices that the Corporation may charge as service charges for water supply services in Schedule 1. The methodology allows an adjustment to service charges to reflect changes to the price the Corporation pays to the Sydney Catchment Authority (**SCA**) for water.

The current determination in respect of the prices charged by SCA (Determination 7 of 2005 entitled "Sydney Catchment Authority") expires on 30 June 2009. The Tribunal will issue a new determination in respect of the price charged by the Sydney Catchment Authority to take effect from 1 July 2009 (**2009 SCA Determination**). Until the 2009 SCA Determination is issued, prices for water supplied to the Corporation by SCA are only known for the period ending on 30 June 2009. The methodology adopted by the Tribunal in Schedule 1 of the present determination permits an adjustment of water prices to reflect changes to the price of water supplied by SCA under the 2009 SCA Determination.

The Tribunal has adopted this approach to ensure that the prices charged to consumers by the Corporation reflect the actual price that it pays SCA for water.

Attachment A Rouse Hill Development Area

LEGEND

- ROUSE HILL DEVELOPMENT AREA (RHDA) BOUNDARY REP 19
- PROJECT AREA BOUNDARY
- STAGE 1
- STAGE 2
- STAGE 3 SECOND PONDS CREEK & BALMORAL ROAD SERVICED AREA
- STAGE 4
- FUTURE STAGES
- TRUNK DRAINAGE

STAGE 3 ROUSE HILL PARKLEA AREA

SECOND PONDS CK SERVICED AREA

STAGE 3 ROUSE HILL PARKLEA AREA

BALMORAL ROAD SERVICED AREA

N

WINDSOR

VINEYARD

BOX HILL

HAWKESBURY COUNCIL BOUNDARY / BAULKHAM HILLS COUNCIL BOUNDARY

BLACKTOWN COUNCIL

RAILWAY

ROAD

ANNANGROVE ROAD

CATTAI

CREEK

RIVERSTONE - BOX HILL

RIVERSTONE EAST

Rouse Hill Regional Park

NORTH KELLYVILLE

RIVERSTONE (EXISTING RESIDENTIAL AREA)

RIVERSTONE RELEASE AREA

BOUNDARY ROAD

DA 20

Proposed Mungarie Park Shopping Complex

Cemetery

ROUSE HILL - PARKLEA

SECOND PONDS CREEK

KELLYVILLE (NOT INCLUDED IN SERVICE AREA)

MARSDEN PARK

SCHOFIELDS (EXISTING RESIDENTIAL AREA)

SCHOFIELDS

GARFIELDS

RICHMOND

SOUTH

ALEX AVENUE

HAMBLEDON ROAD

ALEX AVENUE

TERRACE

STANHOPE

PARKWAY

BALMORAL RD RELEASE AREA

Castle Hill Golf Course

MARSDEN PARK

Waste Services Depot

ROAD

CSR

SCHOFIELDS AERODROME

Prison

SUNNYHOLT ROAD

BLACKTOWN COUNCIL BOUNDARY

QUAKERS HILL (EXISTING RESIDENTIAL AREA)

Proposed Golf Course

NORWEST BUSINESS PARK

Airservices Australia International Radio Transmitter Station

BLACKTOWN

PARRAMATTA

RHIC

ROUSE HILL INFRASTRUCTURE CONSORTIUM PTY LIMITED
'DARIEN'
MILE END ROAD
P.O. BOX 107
ROUSE HILL NSW 2155
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500 0 500 1000 1500 2000 2500

SCALE IN METRES = 1: 50000

CAD FILENAME: S2GE049.DWG
THIS PLOT DATE: 20/06/03

DRAWN BY: CKB
ORIGINATED BY: BMF

FINAL

TITLE

ROUSE HILL INFRASTRUCTURE PROJECT
ROUSE HILL DEVELOPMENT AREA (RHDA)
STAGE 3

DRAWING No. S3GE049

SIZE A3 SHEET

REVISION B

IPART
New South Wales

Independent Pricing and Regulatory Tribunal

Review of prices for Sydney Water Corporation's water, sewerage, stormwater and other services

From 1 July 2008

Water — Draft Report No 1, 2008
March 2008

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The Tribunal members for this review are:

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Mr James Cox, Chief Executive Officer and Full Time Member

Ms Sibylle Krieger, Part Time Member

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Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 18 April 2008.

We would prefer to receive them by email <ipart@ipart.nsw.gov.au>.

You can also send comments by fax to (02) 9290 2061, or by mail to:

Sydney Water Price Review 2007
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB Post Office NSW 1230

Our normal practice is to make submissions publicly available on our website <www.ipart.nsw.gov.au>. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed on the previous page.

We may choose not to publish a submission—for example, if it contains confidential or commercially sensitive information. If your submission contains information that you do not wish to be publicly disclosed, please indicate this clearly at the time of making the submission. IPART will then make every effort to protect that information, but it could be subject to appeal under freedom of information legislation.

If you would like further information on making a submission, IPART's submission policy is available on our website.

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1 Introduction

The Independent Pricing and Regulatory Tribunal of New South Wales (IPART) is responsible for setting charges for a range of monopoly services provided by Sydney Water Corporation (Sydney Water). IPART regulates charges for the following Sydney Water services:

- the provision of water, sewerage[1] and stormwater services to residential and non-residential customers
- the provision or upgrading of water, sewerage and drainage facilities for new developments[2]
- the provision of recycled water services and sewer mining
- a range of ancillary services.

IPART's last determination for Sydney Water's services was made in June 2005 for the period 1 October 2005 to 30 June 2009 (2005 Determination). In the 2005 Determination IPART provided for expenditure by Sydney Water to investigate the construction of a desalination plant for Sydney at Kurnell. While the 2005 Determination was to expire on 30 June 2009, IPART noted that a new determination might be required before then to provide for any change in circumstances.

As anticipated, circumstances have changed and Sydney Water's forecast expenditure has increased significantly since the 2005 Determination. The increase relates principally to the decision to proceed with the construction of the desalination plant but also to the introduction of a number of major recycled water schemes.

Consequently, the Premier wrote to IPART on 13 June 2007[3] requesting that it conduct a full determination considering "all aspects of Sydney Water's revenue and expenditure", taking into account:

- the effect of climatic conditions on Sydney Water's revenue position since the 2005 Determination
- the desalination project

1 Including trade waste.
2 Upfront charges for these services are levied on developers and are known as developer charges.
3 The letter from the Premier is included in Appendix B.

- several recycled water schemes, such as the Western Sydney Recycled Water Initiative Replacement Flows Project (Replacement Flows Project) and the Camellia Recycled Water Project
- other matters, such as the extension of the Climate Change Fund[4] and extensions to existing rebates.

This report explains IPART's review process and decisions, and accompanies and explains IPART's 2008 draft determination.[5] The determination period of the 2008 Determination is 1 July 2008 to 30 June 2012.

1.1 Scope of the review

IPART's review covered Sydney Water's periodic prices for the water, sewerage[6] and stormwater services it provides to around 4 million people in Sydney, Illawarra and the Blue Mountains. It also covered charges for recycled water services to the Rouse Hill Development Area and charges for a range of miscellaneous ancillary services that Sydney Water provides.

IPART is currently conducting a separate review of developer charges for regulated metropolitan water utilities.[7] For this reason, issues relating to those charges were not covered in the review.

In 2006, IPART also made a determination of pricing arrangements for recycled water services and sewer mining (2006 Determination).[8] While this review considered the costs relating to a number of large recycling projects,[9] the 2006 Determination remains in force.[10]

This review of periodic charges was conducted under section 12 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act). Section 15 of the IPART Act requires IPART to consider a broad range of matters when conducting reviews.[11] These matters include:[12]

- consumer protection—protecting consumers from abuses of monopoly power; the standards of quality, reliability and safety of the services concerned; the social impact of decisions; the effect on inflation

4 Previously known as the Water Savings Fund.
5 IPART issues a legal determination that sets out the maximum charges that Sydney Water can levy on customers as well as a report that explains how these maximum charges have been calculated.
6 Including trade waste.
7 Sydney Water, Hunter Water Corporation, Gosford City Council and Wyong Shire Council.
8 IPART, *Pricing arrangements for recycled water and sewer mining*, Determinations No 8 and 9, September 2006.
9 As directed by the Government.
10 With the exception of maximum charges for recycled water for Rouse Hill customers, which IPART has also considered in this review.
11 IPART may also have regard to any other matters it considers relevant.
12 The section 15 requirements are listed in full in Appendix A.

- economic efficiency — greater efficiency in the supply of services; the need to promote competition; the effect of functions being carried out by another body
- financial viability — the rate of return on public sector assets including dividend requirements; the impact on pricing of borrowing, capital and the dividend requirements of agencies
- environmental protection — the promotion of ecologically sustainable development by appropriate pricing policies; considerations of demand management and least-cost planning.

In considering these matters, IPART must balance the diverse needs and interests of stakeholders and the requirement that Sydney Water is adequately recompensed for the services it provides. IPART must also take into account the principles issued by the Council of Australian Governments (COAG) and contained in the National Water Initiative.[13]

In addition, the Minister for Water Utilities (Minister), pursuant to section 16A of the IPART Act, directed IPART to include in its determination an amount representing the efficient costs of:[14]

- the construction and ongoing operation of the desalination plant and associated distribution infrastructure
- the construction and ongoing operating costs associated with the Replacement Flows Project.[15]

The Minister has also noted his intention to issue an additional section 16A direction related to the Camellia Recycled Water Project.

IPART's review of these additional matters at the direction of the Minister under section 16A were limited to assessing whether the projects are being undertaken in a cost-effective manner. The review of these matters has been more limited than IPART's review of Sydney Water's other capital and operating expenditure, where IPART has considered whether Sydney Water's proposed program of capital and operating expenditure represents the best way of meeting the community's requirements for water, sewerage, stormwater and recycled water services.

---

13 The National Water Initiative is built on the principles established in the 1994 COAG Water Reform Framework.

14 A copy of the Minister's direction is included in Appendix D. Section 16A(1) provides that the Minister "may direct the Tribunal, when it makes a determination of the maximum price for a government monopoly service provided by the agency, to include in the maximum price an amount representing the efficient cost of complying with a specified requirement imposed on the agency."

15 This project consists of an Advanced Water Treatment Plant with interconnecting systems from the Penrith, St Marys and Quakers Hill Sewage Treatment Plants, associated infrastructure and a pipeline from the Advanced Water Treatment Plant, a pilot plant at St Marys Sewage Treatment Plant and associated infrastructure.

1.2 Review process

IPART's review included an extensive investigation and public consultation process. As part of the review, IPART:

- Released an Issues Paper in August 2007 to assist in identifying and understanding the key issues for review.
- Invited Sydney Water to provide a submission detailing its pricing proposals, and required it to provide extensive financial and performance data on the future capital and operating expenditure necessary to maintain customer service levels and respond to regulatory demands.[16]
- Invited other interested parties to make submissions.[17]
- Held a public workshop in Sydney on 7 December 2007 to discuss a wide range of issues raised by Sydney Water and other stakeholders.
- Engaged Halcrow Pacific Pty Limited (Halcrow) to review Sydney Water's capital expenditure, asset planning and operating expenditure proposals, and to conduct a separate review of Sydney Water's estimates of its asset lives to assist IPART in assessing the appropriate period over which to amortise Sydney Water's investments.
- Engaged McLennan Magasanik Associates (MMA) to review Sydney Water's water consumption forecasts over the next five years, to comment on the robustness of the approach used by Sydney Water to develop those forecasts and to advise on the reasonableness of the assumptions on which the forecasts were based.

IPART examined Sydney Water's submissions, the independent reviews it had commissioned and the analysis it had undertaken, as well as information and submissions provided by other interested parties. It also considered the matters it is required to consider under section 15 of the IPART Act (see section 1.1 above) and changes in the policy and regulatory environment, including the Government's commitments on water pricing under COAG's Water Reform Framework and the National Water Initiative.

Following the receipt of submissions to this draft determination IPART will further consider all matters raised. IPART anticipates that it will publish and release its final determination (and accompanying report) before 30 June 2008.

16 Sydney Water's submission was received on 14 September 2007.
17 A total of 30 written submissions were received from other interested parties.

1.3 Overview of the determination

In recent years the Government has developed the Metropolitan Water Plan to address Sydney's water needs, including demand pressures likely to arise from drought, climate change and population growth. As part of the Metropolitan Water Plan the Government has required Sydney Water to implement a number of major capital programs, including the construction of the desalination plant and the Replacement Flows Project. These projects have been a key consideration in this determination.

The decisions made in the determination reflect IPART's aim of ensuring that prices are cost reflective while also taking into account the potential impact of those prices on customers, the environment and Sydney Water's financial viability. IPART has also restructured water prices to reflect changes to water availability.

1.3.1 Increases in customer bills

The draft determination will result in higher prices for customers, particularly for water services. These increases are largely driven by costs associated with a number of large capital projects including the desalination plant and the Replacement Flows Project. The sources of these price increases are presented in Table 1.1 below.

Table 1.1 Bill increase for a typical residential bill between 2007/08 to 2011/12 ($2008/09)[18]

Key drivers	SWC 250kL	IPART 250kL	IPART 200kL
Desalination	$100-110	$108	$94
Renewals, servicing growth and licence [a]	$80-85	$71	$63
Improving financial viability. [b]	$50-55	$36	$33
Western Sydney Recycling (Replacement Flows Project)	$30-35	$18	$18
Total	$275	$233	$208

a This figure is calculated as a residual.

b In its calculations, IPART assumed that the source of the price increase attributable to improving financial viability is the result of increasing the WACC for Sydney Water from 6.5% of the previous determination to 7.1% for the current determination and does not incorporate any changes in depreciation assumptions. Sydney Water appears to have included depreciation changes in its calculations.

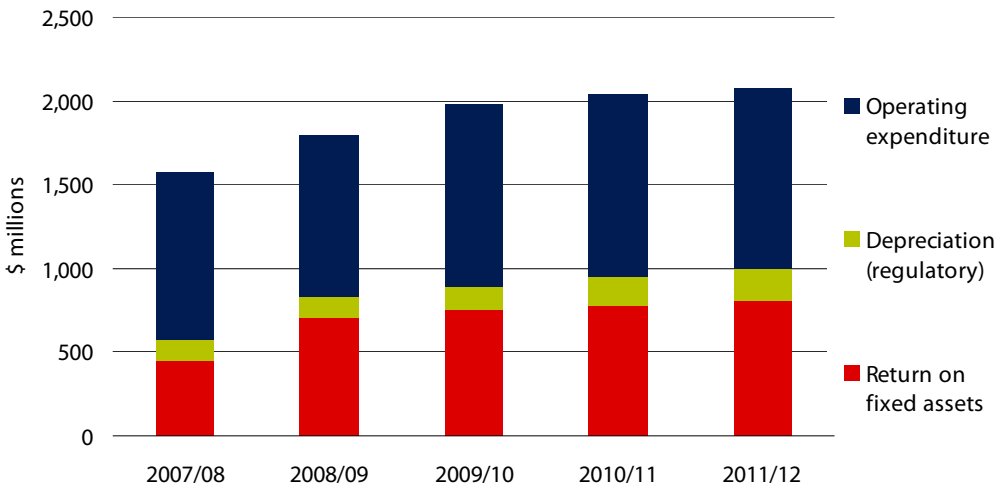
Source: *Sydney Water Submission*, 14 September 2007, p 75 and IPART calculations.

The sources of the price increases is also illustrated in Figure 1.1 below which shows IPART's determined revenue requirement and the building block components that make up this revenue. The IPART determined revenue requirement increases

[18] Sydney Water's submission assumes that a typical household consumes 250kL of water per annum therefore this figure has been used for comparison. This report assumes a typical household consumes 200kL of water per annum which is also presented above. Price adjustments are split between the fixed and usage charge for water and the fixed charge for sewerage and stormwater where appropriate.

substantially over this determination period compared to 2007/08 which is driven largely by the 'return on fixed assets'. This reflects both the increase in the Regulatory Asset Base and the increase in the rate of return on this asset base. The allowed operating expenditure has also increased from 2009/10 largely due to costs associated with the desalination plant.

Figure 1.1 IPART determined revenue requirement for Sydney Water, (real $2007/08)



Combined water and sewerage bills for all users are expected to increase in each year of the determination, with the largest increases being in 2008/09. However, IPART considers that these increases are warranted to ensure that customers have access to a sustainable water supply of appropriate quality and to the other services provided by Sydney Water, and to ensure Sydney Water's financial viability through a period of intensive capital expenditure.

Between 2004/05 and 2007/08 water and sewerage bills for residential customers (with average water consumption of 200kL per year) increased by an average of 2.1 per cent per annum (in real terms).[19] The bill increases for residential customers consuming greater than 400kL of water per annum, however, were substantially larger given the introduction of the Tier 2 water usage charge at the 2005 Determination. For example, between 2004/05 and 2007/08 residential customers consuming 750kL per annum increased by an average of 8.2 per cent per annum (in real terms).

[19] Throughout this report IPART has generally assumed that a typical residential customer consumes 200kL per annum, based on the results of IPART's 2006 Household Survey that found that average residential household consumption was 201kL in 2006, compared with 249kL in 2003. See IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra – Results from the 2006 household survey*, November 2007, p 33). Sydney Water's submission assumes that a typical consumes 250kL per annum.

Residential customers will face additional increases in their water and sewerage bills over the four year period of this Determination, with the bill for a household with average water consumption increasing by an average of 6.4 per cent per annum (in real terms), as illustrated in Table 1.2 below. The largest increase in bills will occur in 2008/09, reflecting costs related to the desalination plant.

The amount of the increase will vary depending on each household's water consumption. Residential customers that use greater than 400kL per annum will face comparatively lower bill increases over the determination period compared to residential customers with lower consumption than this. This largely reflects IPART's decision to remove the Tier 2 usage charge.

Although customers using larger amounts of water will receive comparatively lower bill increases compared to smaller users, it is important to note that the larger water users already received substantially higher bill increases between 2004/05 and 2007/08.

Table 1.2 below also compares the bill increases under Sydney Water's proposal to IPART's draft Determination. Sydney Water's proposal would result in higher bills for customers, particularly for residential customers with higher water consumption. This difference in bills for larger water users mainly reflects IPART's proposal to abolish the Tier 2 water usage charge.

Table 1.2 Summary of proposed annual bills for individually metered residential properties with water and wastewater services (real 2007/08 dollars)

	2007/08	2008/09	2009/10	2010/11	2011/12	Change 07/08 to 11/12
Sydney Water proposed						
100kL pa	597.88	659.37	719.45	741.15	763.33	165.45
% increase		10.3%	9.1%	3.0%	3.0%	27.7%
200kL pa	731.78	817.41	910.67	938.22	966.25	234.47
% increase		11.7%	11.4%	3.0%	3.0%	32.0%
750kL pa	1,639.38	1,966.68	2,300.43	2,367.00	2,440.89	801.51
% increase		20.0%	17.0%	2.9%	3.1%	48.9%
IPART proposed						
100kL pa	597.88	672.97	705.04	731.50	751.58	153.70
% increase		12.6%	4.8%	3.8%	2.7%	25.7%
200kL pa	731.78	826.97	877.04	913.50	934.58	202.80
% increase		13.0%	6.1%	4.2%	2.3%	27.7%
750kL pa	1,639.38	1,754.93	1,823.04	1,914.50	1,941.08	301.70
% increase		7.0%	3.9%	5.0%	1.4%	18.4%

Note: The bill increases from 2009/10 onwards may differ due to future changes in the Sydney Catchment Authority's bulk water costs as discussed in section 4.4.

Commercial and industrial customers will also face higher prices, with the rate of increase depending on the level of water used. As the water usage patterns of these customers are more diverse than those of residential customers, it is difficult to draw general conclusions about the impact of this determination on these customers.

1.3.2 Restructuring water tariffs

In the 2005 Determination IPART introduced an inclining block tariff (IBT)[20] for single dwellings and other individually metered residential properties.[21] This was primarily in response to the prospect of serious water scarcity at the height of the drought. The IBT was intended to provide customers with a strong conservation incentive in relation to their discretionary water use.

Since the 2005 Determination, Sydney Water has commenced construction of the desalination plant and the Government has also announced a number of large recycled water schemes to provide some customers with an alternative source of water and reduce pressures on Sydney's water storages. These factors, together with recent rainfall increases, have helped ease concerns about possible short and medium term water scarcity.

As a result, IPART has decided to replace the IBT with a two-part tariff, made up of a fixed service charge and a single usage charge, for all units of consumption. IPART believes that this is appropriate where there is expected to be little or no water scarcity over the next few years. This restructuring means the usage charge will increase by 37 per cent (in real terms) over the determination period compared to the current Tier 1 usage charge.[22] The usage charge reflects IPART's estimate of the long run marginal cost (LRMC)[23] of supplying water by the end of the determination period and is consistent with the current level of the Tier 2 usage charge.

The fixed charge acts as a balancing item to allow Sydney Water to recover the remainder of its efficiently incurred costs, and will increase by 80 per cent (in real terms) over the determination period. The increase in the fixed charge is partly in response to the desalination plant. It thus also acts as an insurance policy against future water shortages arising from droughts, because the desalination plant is likely to have surplus capacity over the medium term and could increase water supplies when dam levels are low.

IPART has decided to maintain the existing tariff structures in relation to Sydney Water's prices for sewerage, stormwater and other regulated services, although the prices for these services will increase over the determination period.

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20 Section 10.2.2 discusses IPART's reasons for introducing an IBT.

21 Under an inclining block tariff, the usage charge of each succeeding block of usage is higher than the previous block(s).

22 The inclining block tariff will be removed by progressively raising the Tier 1 price to the point where it is equal to the Tier 2 price (which is held constant in nominal dollars until the two prices are the same). At this point, there will be a single price for all units of water.

23 See section 11.2 and Appendix J.

1.3.3 Revenue to maintain service standards and financial viability

IPART has set prices for the determination period to generate total revenue of $7,918 million (in $2007/08 dollars). This means that water and sewerage bills for a household with average water consumption (200kL per annum) will increase by 13.0 per cent (in real terms) in the first year of the determination period and, on average, by 4.2 per cent (in real terms) in each of the remaining years of the period.

IPART's decisions should not adversely affect the ability of Sydney Water to operate, maintain, renew and develop the assets required to deliver the regulated services. The decisions will allow Sydney Water to:

- renew and expand water mains to service new growth and maintain existing standards
- undertake work on pressure management and leakages to reduce main breaks and water losses
- invest in recycled water schemes to further support efforts to balance long term demand and supply
- invest in wastewater infrastructure to reduce both wet and dry weather overflows
- service new urban development
- upgrade sewage treatment plants, including plants in the Hawkesbury/Nepean
- construct the desalination plant (expected to be completed by 2009/10)
- continue and extend existing demand management initiatives, including the retrofit, rainwater tank rebate and educational programs for residential customers, and the Every Drop Counts program for business customers, to address the demand/supply imbalance.

IPART's analysis and financial modelling indicates that Sydney Water will achieve a BBB credit rating by the end of the determination period. Sydney Water is expected to achieve BB+ ratings in earlier years, the lower rating predominantly due to the large amount of debt required to fund the (fully debt funded) desalination plant.[24]

IPART expects that Sydney Water will be able to earn a real pre tax rate of return of 7.1 per cent over the determination period, compared to the 6.0 per cent that it earned, on average, over the past 4 years. IPART's calculation of the rate of return was based on market conditions as at 18 December 2007. IPART recognises that there has been significant volatility in financial markets since 18 December 2007 and that there is likely to be continued volatility in the near future. Prior to its final determination IPART will update its estimate of the rate of return to reflect the market conditions at that time.

[24] Analysing Sydney Water's financial ratios without the desalination plant reveals that Sydney Water would achieve a BBB rating in each year of the determination period.

Based on the prices in this determination, IPART's modelling indicates that Sydney Water will be able to maintain a 52 per cent dividend payout ratio and a BBB credit rating by 2011/12 if the outcomes and targets set out in this report are achieved.

IPART notes that the dividend payout ratio of 52 per cent projected by Sydney Water is substantially below the dividend payout ratios of approximately 75 per cent projected in past determinations. However, this lower dividend payout ratio is warranted given the significant capital expenditure program it has proposed. Typically, a commercial firm conducting large scale capital projects would pay little or no dividends over the intense capital investment period, instead reinvesting funds into the projects and raising new capital as necessary via a share capital raising (either privately or on the stock market). Therefore, a lower dividend payout ratio for Sydney Water is justified during this determination period. However, the exact dividend payout ratio is a matter for negotiation between Sydney Water and the Government.

1.3.4 Inclusion of costs related to environmental projects

IPART considers that its decisions will allow Sydney Water to maintain customer awareness of the value of water and encourage customers to use it carefully. IPART's decisions also take into account capital and operating expenditure associated with meeting environmental licence requirements.

Examples of Sydney Water's environmental programs include:

- **SewerFix** – this program focuses on repairing sewer main chokes but also on minimising repeat impacts on the environment and customers.
- **Wet Weather Overflow Abatement Program** – this program is designed to prevent repeat wet weather overflows to customer properties and sensitive environmental sites.
- **Active Leak Reduction** – this program began in 1999 as one component of Sydney Water's strategy to reach its operating licence water conservation targets.
- **Renewable Energy Generation Program** – this program includes bio-gas fired generation at numerous sewage treatment plants (STPs) and hydro-electricity generation at Prospect Water Filtration Plant, North Head STP and other locations. The desalination plant will be also be powered by renewable energy.

1.4 Structure of this report

This report explains IPART's decisions for the determination in detail, including the analysis supporting each decision:

- Chapter 2 gives an overview of Sydney Water's operations and its submission to IPART

- Chapter 3 gives an overview of IPART's approach to setting prices for Sydney Water
- Chapter 4 sets out and explains IPART's decisions on the regulatory framework applied to the determination period
- Chapter 5 explains the 'building block' approach used to establish Sydney Water's notional revenue requirement, and gives an overview of IPART's decisions on the notional revenue requirement for Sydney Water
- Chapters 6 to 8 discuss the individual elements of the 'building block' approach and IPART's findings on these as follows:
  - Chapter 6 explains IPART's findings on the revenue required to meet operating expenditure obligations, including an allowance for the costs associated with working capital
  - Chapter 7 explains IPART's assessment of the prudence of Sydney Water's past capital expenditure and the efficiency of its forecast capital expenditure, which is a key consideration when deciding on the revenue required for capital investment
  - Chapter 8 explains IPART's findings on the revenue required for capital investment, including an appropriate return on assets and a return of capital (depreciation)
- Chapter 9 sets out the assumptions about metered water sales and customer numbers that IPART has adopted in analysing Sydney Water's expenditure requirements and its ability to recover revenue
- Chapter 10 discusses price structure and IPART's decisions on the appropriate price structures for the determination period
- Chapter 11 sets out IPART's price decisions for specific services provided by Sydney Water
- Chapter 12 analyses the impact of IPART's pricing decisions for Sydney Water, its customers and the environment.

2 Overview of Sydney Water's operations and submission

Sydney Water's submission to this review took place against the backdrop of uncertainty over long term water scarcity and an expanding population in the Sydney region. The Government has responded to these pressures on Sydney's water resources by developing the Metropolitan Water Plan, a strategy for securing Sydney's water supply into the future. Sydney Water has been given the responsibility of implementing a number of large scale projects within the Plan. Sydney Water's submission to this review reflects these new projects which will place great pressure on the water prices.

This chapter gives an overview of Sydney Water's operations and a summary of its submission to IPART.

2.1 Sydney Water's operations

Sydney Water is the largest water agency in NSW, and provides services to a population of around 4 million in Sydney, Illawarra and the Blue Mountains. However, unlike the other water agencies, it does not manage its own bulk water supplies. Instead, Sydney's drinking water storages and catchments are managed by the Sydney Catchment Authority (SCA), with Sydney Water purchasing bulk water from SCA.

Sydney Water treats and distributes over 1.4 billion litres of drinking water per day via a network of 255 service reservoirs, 148 water pumping stations, 9 water filtration plants and 20,752 km of water mains. It collects and treats more than 1.3 billion litres of wastewater each day through its 23,500km of sewer pipes in 25 separate sewerage systems with 31 sewage treatment plants. Around 60 million litres of recycled water is distributed daily via 6 reservoirs, 4 pumping stations and 3 recycled water treatment plants. Sydney Water also provides stormwater drainage facilities through 443 km of stormwater channels.

Sydney Water was formed in 1995 as a state-owned corporation (SOC) under the *State Owned Corporations Act 1989*. Under section 21 of the *Sydney Water Act 1994*, it is required to fulfil three principal objectives:

- to be a successful business
- to protect the environment
- to protect public health.

To promote these objectives and to prevent abuses of Sydney Water's monopoly position, the Government granted Sydney Water an operating licence which sets minimum performance standards it must meet as well as obligations in relation to customer service, system performance and environmental performance. The licence also requires Sydney Water to have a Customer Contract setting out the rights and obligations of customers and of Sydney Water, including customer complaint handling procedures and rights of redress if there is a failure to provide the agreed level of service.

IPART conducts an annual audit of Sydney Water's compliance with its operating licence, and can impose large financial and other penalties for breaches of this licence.

2.2 Sydney Water's historical revenue

IPART has determined maximum prices for Sydney Water since 1993. Since this period there have been some reductions in tariffs resulting in lower tariff revenue for Sydney Water, as indicated in Figure 2.1 below. The elimination of the majority of property based charges between 1992/93 and 1995/96 resulted in a substantial reduction in tariff revenue. Since 1995/96 tariff revenues have remained relatively stable despite the increases in service quality (such as upgrading of sewage treatment plants) and increases in population growth.

Figure 2.1 Sydney Water's revenue from tariffs (real $2007/08)

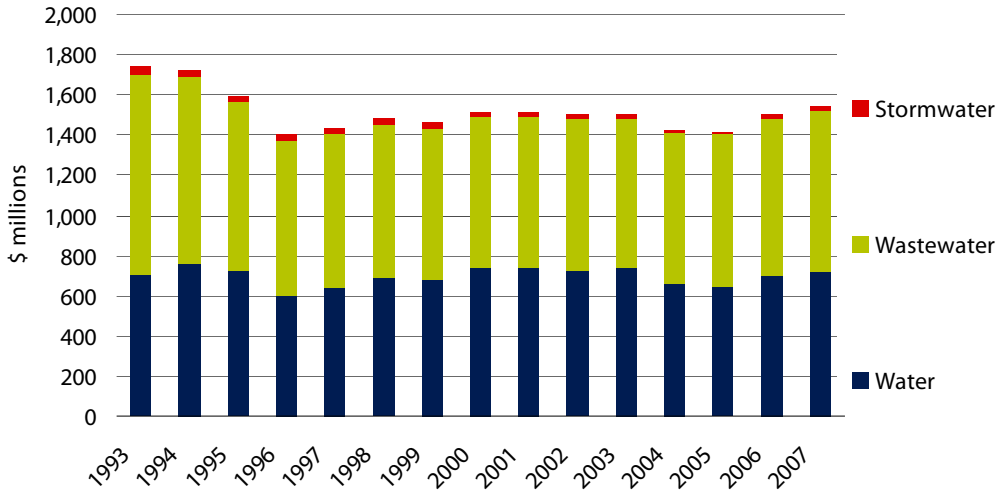
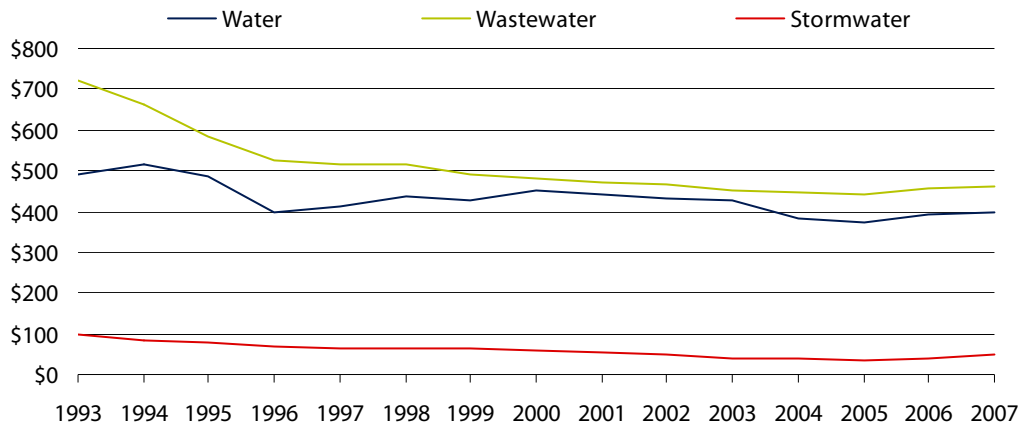


Figure 2.2 below adjusts revenue from tariffs for changes in property numbers over this period. As illustrated by this figure the revenue per customer has declined substantially since 1992/93. For example, in 1992/93 Sydney Water collected revenue from water tariffs of approximately $500 per customer (in 2007/08 dollars) compared to $400 per customer in 2006/07.

Figure 2.2 Sydney Water's revenue per customer (real $2007/08)



2.3 Sydney Water's submission

Sydney Water's submission seeks significant price increases to:

- Support its commitment to the Metropolitan Water Plan. This includes the construction of the desalination plant and a number of large scale recycling schemes, as well as an increase in spending on the demand management program.
- Improve its overall financial position. This includes a higher rate of return, changes to water sales forecasts to reflect new circumstances, raising prices to achieve full cost recovery in Year 1 and changes to asset lives.
- Increased maintenance expenditure on existing assets to meet operating licence obligations.

Sydney Water seeks to increase its revenues (in real $2008/09 dollars) by approximately 28 per cent over the determination period, from $1.70 billion in 2007/08 to $2.18 billion in 2011/12, to meet its commitments. This is discussed further in section 5.2.

In order to achieve the revenues set out in the table above, Sydney Water projects that a typical household's water and sewerage annual bills will need to increase from approximately $820 in 2007/08 to $1,095 in 2011/12. This represents a $275 or 33 per cent real increase in bills for a typical household over the determination period, compared to current bills. Sydney Water's submission assumes that a typical household consumes 250kL of water per annum.[25]

[25] In presenting the potential impact of this determination on residential customers, IPART has assumed (unless otherwise stated) that a typical household consumes 200kL of water per annum, consistent with the findings in its 2006 Household Survey.

Sydney Water's submission highlights that a large proportion of the bill increase over the determination period is driven by projects imposed on it by the Government such as the desalination plant and recycled water projects. Table 2.1 below summarises the key drivers of these bill increases over the length of the determination period.

Table 2.1 Components of the increase for a residential water and wastewater bill, assuming water consumption of 250kL per annum

From 2007/08 to 2011/12 ($2008/09)	Increase (range)
Desalination	$100-110
Renewals, servicing growth and licence	$80-85
Recycling and demand management	$30-35
Improving financial viability	$50-55
Total	$275

Source: Sydney Water submission, 14 September 2007, p 75.

Sydney Water has dedicated a separate chapter (Chapter 5 of its submission) to the pricing treatment of the desalination plant. Sydney Water has established a special purpose subsidiary company - Sydney Desalination Plant Pty Ltd (SDP) - to own the desalination plant and the intake and outlet pipes at the Kurnell site. However, Sydney Water will retain ownership of the water pipeline infrastructure.

Sydney Water will collect all revenue on behalf of the SDP, through customer bills. Payments to SDP will be in the form of an availability charge (for providing the plant) and a volumetric charge for the water produced. Approximately 70 per cent of the operating costs of the SDP are for electricity, chemicals and consumables that are proportional to the usage of the plant.

Sydney Water's decision regarding its internal business structure does not have a bearing on IPART's determination. IPART's primary interest is to consider the efficient cost of providing its services.

3 IPART's approach to setting prices

This chapter explains the process that IPART has followed in this review to set maximum prices for Sydney Water's services.

As in previous metropolitan water determinations, IPART has used a form of incentive regulation known as CPI±X for this determination.

3.1 Determining the notional revenue requirement

The first step in the process was to determine Sydney Water's notional revenue requirement. This was calculated by analysing the efficient operating and capital costs of providing appropriate levels of service over the determination period. In calculating this requirement, IPART formed a view on the efficiency gains that Sydney Water could reasonably achieve during this time.

The purpose of incorporating efficiency gains into the notional revenue requirement is to provide Sydney Water with guidance about its potential to improve the efficiency of its operating and capital expenditure without reducing the quality of the services it delivers. The incentive to pursue efficiency gains arises from the fact that prices are set for the determination period and are not linked to costs actually incurred. It follows that if Sydney Water achieves better than expected cost savings during the determination period it can expect to earn a higher return than forecast by IPART. Efficiency gains have also been incorporated to provide a basis for IPART's decision on the revenue requirement.

In deciding on an appropriate allowance for capital expenditure and applying the 'building block' approach,[26] IPART has incorporated all renewals and maintenance capital expenditure where that expenditure has been based on sound asset management practices and has been appropriately justified by Sydney Water. Where Sydney Water seeks easy cost savings by delaying essential renewals and maintenance expenditure it does so at its own risk, and not as a result of IPART's regulatory pricing approach.

The calculation of the individual elements of the revenue requirement are discussed in Chapters 5 to 8.

26 The 'building block' approach is outlined in Chapter 5.

3.2 Forecasting metered water sales and customer numbers

Having established the notional revenue requirement, IPART then set prices for individual services to recover these costs. Prices were set based on forecasts of water sales and customer numbers. Forecasting water sales is difficult, and if forecasts are not reasonable, there is a risk that prices set by IPART will lead to Sydney Water significantly over- or under-recovering its required revenue. IPART's approach to forecasting metered water sales and customer numbers is discussed in Chapter 9.

3.3 Price structures and price levels

IPART then identified the broad pricing approaches that could feasibly be applied by Sydney Water to translate the revenue requirement into prices, and assessed the overall average impact of each of these approaches on customers and Sydney Water.

IPART identified feasible pricing structures and calculated actual prices for all or a selection of the identified pricing approaches. In doing this, IPART evaluated the proposals advanced by Sydney Water in its submission.

IPART sets prices that are designed to generate revenue through a combination of periodic fixed and usage charges. Key features of Sydney Water's current pricing structure include:

- uniform or 'postage stamp' pricing for water and sewerage services across Sydney Water's area of operations
- recovery of most of the costs associated with sewerage and stormwater services through fixed charges
- recovery of a significant portion of the costs associated with water services through volumetric usage charges (where customers are charged for each kilolitre of water) with the remainder of costs recovered through fixed charges
- water usage charges designed to encourage efficient water consumption and set with reference to the LRMC of water supply[27]
- calculation of fixed charges for water services as the residual of the revenue requirement not recovered through usage charges or developer charges.

In deciding on pricing levels, IPART takes into account the matters set out in section 15 of the IPART Act, including Sydney Water's financial viability and the impact of its prices on customers. The balancing of these competing interests may mean that the target revenue derived by prices is less than IPART's determined notional revenue requirement.

[27] The LRMC represents the incremental cost of funding measures to bring supply and demand into balance over the longer term. See Chapter 10.

In evaluating the impact on customers, IPART considers the magnitude of price increases in each year of the determination period and the effect of these increases on customer bills of varying consumption levels.

In considering financial viability and sustainability, IPART has examined Sydney Water's forecast credit rating, taking into account its existing cash/debt levels and its ability to pay dividends. IPART has also considered Sydney Water's 'benchmark financial structure' consistent with the Weighted Average Cost of Capital (WACC) parameter assumptions IPART has made in this determination.[28]

In considering economic efficiency, IPART examines the signals sent to customers, cost reflectivity and consistency with LRMC.

[28] The WACC is a weighted average of the cost of debt and equity. See Chapter 8 and Appendix F.

4 IPART's decisions on the Regulatory Framework

As part of its review, IPART was required to decide on the appropriate length of the determination period and other issues relating to the regulatory framework of the determination. These include:

- the aggregate pricing approach
- whether to maintain the mechanism that adjusts for differences between Sydney Water's forecast water sales and its actual water sales
- whether to introduce a mechanism to account for changes in the cost of bulk water purchased from SCA
- regulatory arrangements for recycled water
- the development of output measures to assist in the review of Sydney Water's capital works program.

4.1 Length of the determination period

Decision

1 IPART's decision for the draft determination is to adopt a four year determination period (from 1 July 2008 to 30 June 2012).

IPART has considered a range of factors in determining the length of the determination period, including:

- The confidence IPART can place in Sydney Water's forecasts. If, for example, the expenditure profile can only be reliably predicted for two years, a short determination period may be more appropriate.
- The alignment of the determination period with the next SCA determination, given the significance of SCA's bulk water charges for Sydney Water's operating costs. The next SCA determination is scheduled to commence in September 2008, with new prices applying from 1 July 2009.

The advantages of a longer determination period include stronger incentives for Sydney Water to increase efficiency, greater stability and predictability (which may lower Sydney Water's business risk and assist investment decision-making) and lower regulatory costs. Disadvantages include the increased risk associated with inaccuracies in the data used to make the determination, possible delays in customers

benefiting from efficiency gains (because prices are not set to account for these gains until the next determination) and the risk that changes in the industry will affect the appropriateness of the determination.

On balance, IPART considers that a four year determination period (1 July 2008 to 30 June 2012) is appropriate. This should also enable Sydney Water to take positive steps to improve its information collection and recording systems, develop more comprehensive pricing proposals and undertake work to correct other shortcomings identified in the review.

4.2 Aggregate pricing approach

Decision

2 IPART's decision for the draft determination is to set prices so that Sydney Water's targeted revenue approximates its notional revenue requirement in NPV terms throughout the determination period, less approximately $17 million.[29]

Having decided on the length of the determination period, IPART needed to decide on the aggregate pricing approach to be pursued. In the 2005 Determination, IPART adopted a 'P_0 approach', where the increase permitted in the first year of the determination period was higher than in subsequent years. A single 'X-factor' was set for subsequent years to ensure that prices changed smoothly over the remainder of the determination period in real terms, and that the targeted revenue in the final year of the determination period equalled the notional revenue requirement for that year. This approach is sometimes described as the 'glide path' approach.

In its submission, Sydney Water argued against the glide path approach because under it Sydney Water only receives its full revenue requirement in the final year of the determination, forfeiting revenue in earlier years.

IPART has decided that it will not set prices that allow Sydney Water to achieve its notional revenue requirement in NPV terms. Instead, the prices set by IPART will result in revenue that is approximately $17 million less than the calculated notional revenue requirement. This largely reflects IPART's decision to adjust the revenue to be collected for sewerage services because it was not convinced of the merit of Sydney Water's proposals (see Chapter 10). Notwithstanding this adjustment, IPART is of the view that Sydney Water will have sufficient income to fund its major works programs and to provide a substantial benefit to all users in the longer term.

IPART notes that, in coming to this decision, it has considered, as required under section 15 of the IPART Act, the potential financial implications of the decision, but also its impact on customers. It has also taken into account the revenue required for

[29] $15.4million of this NPV shortfall relates to the sewerage usage charge (discussed in section 10.3) with the balance relating to IPART's decision to increase the stormwater charges by CPI over the Determination period.

Sydney Water to fund its operating and capital expenditure needs, which are particularly high in the first 2 years of the determination period.

4.3 Consumption adjustment mechanism

Decision

3 IPART's decision for the draft determination is to not incorporate a consumption adjustment mechanism.

In the 2005 Determination for Sydney Water, IPART adopted a mechanism to address the risk to an agency of variations between forecast and actual consumption. In this review, IPART considered several options, including:

- no adjustments for demand variation
- price adjustment in the subsequent determination period to account for variation outside a specified deadband
- an annual price adjustment mechanism to account for variation outside a deadband of +/- 10 per cent, combined with a final 'wash-up' adjustment as part of the subsequent determination for all variations within this deadband.

In the 2005 Determination IPART implemented the option of making price adjustments in the subsequent determination for all variations unrecovered or not passed-through where the variation was outside a deadband of +/- 10 per cent. However, this provision was not triggered because the determination period did not run to completion and the variation to date is under the 10 per cent threshold.

IPART notes that in the 2005 Determination there was substantial uncertainty about water availability (due to drought) and the period over which water restrictions would remain in place. That uncertainty has lessened because of rising dam levels (which are currently close to 66.4 per cent) and will lessen further in the future due to construction of the desalination plant. Accordingly, IPART considers that a consumption adjustment mechanism is not necessary.

4.4 Cost pass-through mechanism for SCA's costs

Decision

4 IPART's decision for the draft determination is to introduce an adjustment mechanism in this determination to allow incorporation of prices to be set at the next review of SCA's prices.

A major operating expenditure item for Sydney Water is the cost that it pays for the purchase of bulk water from SCA. IPART is also responsible for setting the bulk water price that SCA can charge Sydney Water. It last set this price as part of the 2005 Determination.

In past determinations IPART has set prices for Sydney Water and SCA at the same time. The prices determined for Sydney Water were therefore able to incorporate SCA's bulk water costs. However, the timing of the current review means that prices for Sydney Water and SCA are not being set simultaneously. IPART will be conducting a review of SCA's prices to apply from 1 July 2009. Given the magnitude of bulk water costs for Sydney Water, its inability to influence these costs and the fact that IPART will be able to scrutinise these costs, IPART consider that it is appropriate to introduce an adjustment or 'pass-through' mechanism in this determination.[30]

IPART notes that the cost of Sydney Water's bulk water purchases from SCA is affected by the price of bulk water as well as the volume of water purchased. It is also important to distinguish between bulk water purchased from SCA and water purchased from the desalination plant. These factors have been considered in this review. The determination only makes adjustments to reflect changes in SCA's bulk water prices. No adjustments have been made to reflect changes in the volume of bulk water purchased by Sydney Water compared to that projected in this review.

The proposed formula used to adjust prices is presented in the legal Determination accompanying this report. The formula makes adjustments for future changes to the price of bulk water that SCA charges Sydney Water compared to the price assumed by IPART for this determination. In its modelling for this determination IPART has assumed that SCA's prices remain constant in real terms from 1 July 2009. If IPART revises SCA's price of bulk water to apply from 1 July 2009 then this formula makes an adjustment compared to the bulk water charges assumed in IPART's modelling so that the differences in resulting SCA bulk water charges are passed through to Sydney Water's retail customers. As noted in Chapter 10, IPART has set the water price structure such that the usage price is set at the long run marginal cost of water supply, with the fixed charge being the balancing item. Hence, any changes in SCA's bulk water costs are passed through to Sydney Water's customers through the fixed component of the charge.

4.5 Regulatory arrangements for recycled water

Decision

5 IPART's decision for the draft determination is to allow the costs associated with the Replacement Flows Project to be recovered through water charges across Sydney Water's customer base.

As noted in section 1.1, in 2006 IPART completed a review of pricing arrangements for recycled water and sewer mining. As part of this review, IPART set recycled water prices for customers in the Rouse Hill Development Area. It has not made

30 This is consistent with the approach adopted for the Electricity Distribution Pricing 2004/05 – 2008/09 determination. In this determination specific cost pass through mechanisms were adopted to take account of events that it was known would occur in the determination, but could not be quantified.

determinations for other recycled water schemes or for sewer mining, but has developed a pricing framework that divides recycled water projects into two groups:

- mandated schemes
- voluntary schemes.

This distinction reflects the degree of choice that customers have when connecting to recycled water schemes, which in turn influences the relative market power of recycled water suppliers and customers.

A mandated scheme requires customers to connect due to government policy. IPART decided that it would only determine a price for mandated schemes where there was sufficient information for it to set efficient prices. Rouse Hill was the only scheme to meet this criterion. For mandated schemes where there was insufficient information to set prices, IPART established pricing guidelines to assist water agencies in calculating prices. These guidelines require prices to be structured to include a usage charge set at a level that sends appropriate consumption signals aimed at equating the demand for recycled water with the available supply.[31] Prices may also include a fixed charge.

A voluntary scheme does not require customers to connect. Customers of voluntary schemes have a substitute water product available to them (usually at a regulated price) such as potable water or river water. IPART decided not to determine prices for these customers, allowing prices to be determined by direct negotiation between the parties.[32]

In its submission, Sydney Water's capital works program includes a range of large scale recycled water schemes. As noted in Chapter 1 the Minister, pursuant to section 16A of the IPART Act, has directed IPART to include in its determination the efficient costs of construction and ongoing operation of the Replacement Flows Project.

The Replacement Flows Project will replace up to 18 billion litres of drinking water currently being released each year from Warragamba Dam into the Hawkesbury-Nepean River with highly treated recycled water. By doing this, the project will free up water in the Dam to be treated for potable use.

Consistent with the Ministerial direction, IPART has therefore allowed these costs to be recovered from all water users in Sydney Water's area of operation.[33]

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31 The guidelines also require the usage price for recycled water to link to the potable water price where demand for recycled water is expected to exceed supply by more than 10 per cent.

32 IPART suggested some high level principles to help guide the negotiations.

33 As noted in Chapter 1, the Minister has signalled his intention of making a similar direction in relation to the Camellia Recycled Water Project, and so IPART will need to consider this issue again upon receipt of this direction.

4.6 Output measures

Decision

6 IPART's decision for the draft determination is to require Sydney Water to establish target levels for the output measures described in Appendix E and to report on progress against these measures.

In the 2005 Determination, independent consultants (Atkins/Cardno)[34] were engaged to assess Sydney Water's operating and capital expenditure noted that it was difficult to assess whether past projects were prudent as it was not possible to verify actual outputs against those planned. Atkins/Cardno recommended that IPART specify outputs for each agency to facilitate a more robust review in later determinations. Accordingly, in the 2005 Determination, IPART specified a set of output measures with target levels established by Sydney Water based on its proposed expenditure program.

For this review Sydney Water has reported progress in achieving each of the targets set. This information was used by Halcrow in its assessment of Sydney Water's progress.

IPART supports maintaining the use of output measures as a starting point for the assessment of prudent expenditure and the basis for reporting on any deviation from targets established.

The current output measures were established in 2005 and reflected Sydney Water's proposed forward program at that time. Many of the measures cover Sydney Water's core business, such as the renewal of mains, and remain appropriate for forward projection. However, some projects that formed part of that program have now ceased, while Sydney Water has proposed some new capital projects to commence in 2008.

IPART has, therefore, revised the previous output measures to reflect the nature of the capital program over the upcoming determination period, as presented in Appendix E. IPART seeks Sydney Water's comments on these output measures and appropriate targets for each measure. The final output measures and associated targets will be presented in the final determination report.

IPART also requests that Sydney Water provide a list of the capital projects to be undertaken over the determination period. This list will be included in the final determination report.[35] IPART expects Sydney Water to monitor its expenditure in these projects and provide annual progress reports. In addition, Sydney Water should provide a reconciliation of its expenditure and outcomes against the IPART capital and operating expenditure allowances.

34 Atkins/Cardno is a consortium of WS Atkins International Ltd. and Cardno MBK.
35 A similar table was included on p 51 of the 2005 Determination Report.

5 Sydney Water's notional revenue requirement

One of the key inputs to IPART's decisions on maximum prices is its calculation of the amount of revenue required for Sydney Water to efficiently provide water, sewerage and stormwater drainage services and earn a return on its asset base. This is known as the 'notional revenue requirement'. As discussed in Chapter 3, IPART has calculated Sydney Water's notional revenue requirement using the 'building block' approach.

This chapter provides an overview of the key elements of the 'building block' approach, Sydney Water's requested notional revenue requirement and IPART's findings on this issue.

5.1 IPART's approach to calculating the revenue requirement – the 'building block' approach

A key component of IPART's approach to price setting involves calculating Sydney Water's notional revenue requirement by assessing its future cash flow needs. The notional revenue requirement needs to be sufficient to cover:

- the operation, maintenance and administration costs of Sydney Water's core business
- capital maintenance, also referred to as depreciation, which recognises that in the provision of services to customers, Sydney Water's capital infrastructure will wear out
- a return on the capital invested in Sydney Water's business
- an allowance for working capital.

The notional revenue requirement can be represented by the following formula (commonly described as the 'building block' approach):

$$R = O + M + A + W + C + D$$

Where R = revenue requirement

Non-capital costs: O = operations expenses

M = maintenance expenses

A = administration expenses

W = allowance for working capital

Capital costs: C = return on capital

D = return of capital (depreciation)

Chapters 6 to 8 provide a detailed explanation of the individual elements of the 'building block' approach.

5.2 Sydney Water's proposal

In Sydney Water's submission it seeks to increase its revenue requirement by approximately 29 per cent in real terms over the determination period, from $1.88 billion in 2008/09 to $2.2 billion in 2011/12, as presented in Table 5.1 below.

Table 5.1 Sydney Water's proposed revenue requirement ($million, real 2007/08)

	2008/9	2009/10	2010/11	2011/12	Total
Operating costs [a]	984	1,001	995	986	3,966
Return on and of capital [b]	893	924	980	1,030	3,827
Revenue requirement (excluding desalination) [c]	1,877	1,925	1,975	2,016	7,793
Desalination revenue requirement [d]	0	148	177	175	500
Total revenue requirement	1,877	2,073	2,151	2,191	8,293

a From Sydney Water submission Table 3.5 page 21 adjusted to 2007/08 dollars (excluding desalination).

b Calculated as revenue requirement (excluding desalination) minus operating costs.

c From Sydney Water submission Table 7.1 page 68 and Table 7.2 page 69 adjusted to 2007/08 dollars and including an estimate for trade waste and ancillary services. Sydney Water's revenue requirement figures excluded revenue from trade waste and ancillary services.

d From Sydney Water submission Table 7.2 page 69 adjusted to 2007/08 dollars.

Note: Figures may differ from figures in this report used in calculations due to clarifications and further detail received from Sydney Water within the Annual Information Return.

Source: Sydney Water Submission, 14 September 2007, pp 21, 68 & 69.

In order to achieve the revenue requirements indicated in the table above, Sydney Water projects that a typical (consuming 250kL per annum) household's water and sewerage annual bill needs to increase from approximately $820 in 2007/08 to $1,095 in 2011/12. This represents a $275 or 33 per cent increase (above inflation).

5.3 IPART's draft determination

IPART has determined the revenue requirement to be used for setting water prices. The table below sets out IPART's determined revenue requirement and compares it to Sydney Water's proposal.

Table 5.2 IPART determined notional revenue requirement ($million, real 2007/08)

	2008/9	2009/10	2010/11	2011/12	Total
Operating expenditure [a]	962	1,092	1,102	1,085	**4,242**
Return on working capital	3	5	7	8	**23**
Return on fixed assets	703	746	779	811	**3,038**
Depreciation	134	151	167	182	**634**
Notional revenue requirement	**1,802**	**1,994**	**2,055**	**2,086**	**7,938**
Difference to Sydney Water's proposal	(4.0%)	(3.8%)	(4.5%)	(4.8%)	(4.3%)

e Operating expenditure includes total revenue requirement for desalination consistent with Table 6.5.

A detailed explanation of the variations between Sydney Water's proposed revenue requirement and the notional revenue requirement determined by IPART is provided in the following chapters:

- Chapter 6 discusses operating expenditure and working capital
- Chapters 7 and 8 discuss capital expenditure (ie, the return on assets and depreciation).

6 Revenue requirement for operating expenditure and working capital

To determine the notional revenue required by Sydney Water for operating and maintenance expenditure (operating expenditure), IPART assessed Sydney Water's proposed operating expenditure and determined the efficient level of operating and maintenance costs it will incur in providing services over the determination period.

As part of this assessment IPART engaged Halcrow, an independent engineering consultant, to review Sydney Water's forecast operating expenditure and recommend the efficient level for this expenditure. IPART also invited submissions from other stakeholders on:

- the efficiency of the projected operating expenditure outlined in Sydney Water's submission
- whether there was scope for Sydney Water to achieve further efficiency gains over the determination period.

This chapter gives an overview of IPART's findings on operating expenditure as follows:

- section 6.1 outlines Sydney Water's submission on its historical and forecast operating expenditure
- section 6.2 details Halcrow's review and recommendations on these forecasts
- section 6.3 summarises stakeholders' submissions on Sydney Water's forecasts
- section 6.4 provides IPART's analysis and findings about Sydney Water's operating expenditure.

6.1 Sydney Water's submission

Sydney Water's submission notes that the majority of its operating costs arise from the purchase of bulk water from SCA and the treatment of that water at four privately owned and operated water filtration plants. These costs are external costs and are not within Sydney Water's control. Labour and contracts also form a significant proportion of its operating costs.

The submission also notes that operating costs over the current determination period have increased by 1.5 per cent compared to the level calculated by IPART at the 2005 Determination. This is due to the inclusion of a range of new projects (eg, additional

demand management programs and water restrictions patrols) which were not included in the 2005 Determination. Sydney Water points out that this increase masks the productivity savings it has achieved and which have reduced its underlying operating cost base. Table 6.1 shows Sydney Water's reported performance against the 2005 Determination.

Table 6.1 Operating expenditure for the current determination ($m nominal)

	2005/06	2006/07	2007/08	Total
IPART determination	907	932	963	2,801
Sydney Water performance	878	970	997	2,844
Variance	-29 (-3.2%)	38 (4.1%)	34 (3.5%)	43 (1.5%)

Source: Sydney Water submission, 14 September 2007, p 16.

Sydney Water's submission contains operating cost projections for four years starting in 2008/09, as illustrated in Table 6.2 below. Operating costs are projected to rise only marginally above 2007/08 levels. Sydney Water notes that it will achieve productivity savings over the next four years, but that these will be offset by new commitments, including:

- the costs of operating the desalination plant ($55 million in 2010/11 and 2011/12) and various large recycled water schemes
- increased expenditure on demand management programs and increased contributions to the Climate Change Fund.

Table 6.2 Proposed operating expenditure for next determination ($million, real 2007/08)

	2007/08 (2005 Determination)	2008/09	2009/10	2010/11	2011/12
Total	974	984	1,029	1,048	1,041

Note: Figures differ from figures quoted in Table 5.1 due to clarifications and further detail received from Sydney Water within the Annual Information Return.

Source: Sydney Water Annual Information Return 2007 and further clarifications and assumptions.

Chapter 5 of Sydney Water's submission is dedicated to the desalination plant. The Government has announced that the desalination plant will be powered entirely by green energy. This will (based on current electricity prices) increase the operating costs of the plant. It is also anticipated that the plant will operate at full capacity for its first two years (the warranty period), after which its operation will be guided by dam levels. This will mean that, for the first two years of operation, Sydney Water will be substituting water from the desalination plant with bulk water from SCA. This is likely to significantly increase Sydney Water's bulk water costs in these two years due to the comparatively high cost of water sourced from the desalination plant.

Sydney Water's submission does not separately discuss the net effect of the desalination plant on its operations.

6.2 Halcrow's review

Halcrow's approach in reviewing Sydney Water's proposed capital and operating expenditure was to focus on the processes and systems used by Sydney Water to develop its expenditure program. In other words, Halcrow did not undertake a detailed investigation of each project of works but instead analysed the processes that led to the project being approved for inclusion in the expenditure program. Halcrow's view was that if it could satisfy itself that the processes used were robust, detailed and appropriately took into account the specific issues identified in the scope of services, it could be confident of the efficiency of the expenditure program.

6.2.1 Historical operating expenditure

Halcrow noted that Sydney Water had performed reasonably well in achieving the operating expenditure targets set in the 2005 Determination. Sydney Water's total operating expenditure was $2,591 million, compared to the target of $2,384 million. The variation from the 2005 Determination was mainly a result of a significant overspend of over $406 million for water offset by a $211 million underspend for sewerage compared to the IPART determined values.

Halcrow reviewed Sydney Water's historical operating expenditure to use as the foundation for the analysis of proposed operating expenditure. This review considered recent average historical expenditures and also major new responsibilities. Halcrow cross-checked the historical operating expenditure against the average expenditure over the period 1992/93 to 2007/08 to identify long term trends.

Halcrow's review identified a number of discrepancies in the reporting of both budgeted and actual operating expenditure, and Sydney Water was asked to explain these discrepancies. While Halcrow noted that this highlights some significant issues with Sydney Water's reporting of its performance, it did not indicate a systemic problem in meeting operating expenditure targets.

Halcrow's review of the historical operating expenditure over the period up to 2007/2008 concluded that Sydney Water's historical operating expenditure appeared to be appropriate and could be used as the basis for the analysis of Sydney Water's proposed operating expenditure.

6.2.2 Future operating expenditure

Halcrow reviewed Sydney Water's proposed operating expenditure by identifying key cost drivers and analysing the proposed increases and reductions in expenditure. The review included detailed interviews with Sydney Water staff and the identification and review of key documentation and supporting information provided by Sydney Water.

Halcrow also reviewed the processes that Sydney Water has in place to develop its operating expenditure program. It reviewed the business cases for major projects, including the Replacement Flows Project, and specific detailed information on the desalination plant.

Halcrow identified a potential issue with how the Design, Build, Operate and Maintain (DBOM) contract for the desalination plant covers potential adjustments to operating expenditure, particularly those related to the price of renewable energy. Sydney Water reported that the potential impacts of this would not be clear until the contract for the supply of the renewable energy was finalised. Halcrow noted that Sydney Water is being advised by external consultants and specialists in renewable energy and must rely on the advice provided by those experts to ensure that risks of future movements in energy prices are appropriately dealt with.

Halcrow's review of Sydney Water's proposed operating expenditure generally indicated that the processes used by Sydney Water to develop their operating expenditure program appear to be reasonably robust and that therefore the proposed expenditure is likely to be efficient.

6.3 Stakeholders' submissions

In general, stakeholders did not provide substantive comment on Sydney Water's proposed operating expenditure nor the potential for Sydney Water to achieve further efficiency gains over the determination period.

The UNESCO Centre for Membrane Science and Technology at the University of New South Wales (UNSW) commented on the cost of operating the desalination plant. It noted that the electricity costs of operating the plant are substantial and that, based on overseas experience, Sydney Water will need to hedge its power costs.

The Total Environment Centre (TEC) raised concerns about Sydney Water's proposal to operate the plant when dam levels fell below 70 to 80 per cent. It believes that the plant should only operate as a critical drought relief measure:[36]

> The more appropriate use for desalination is as an emergency supply during periods of severe shortage and it is our view that the operating rules for a desalinisation plant should be that it is only operated as a critical drought relief measure and customers should only be expected to meet the costs of a desalination plant operated on that basis.

[36] Mr Leigh Martin, Total Environment Centre, Transcript for public hearing, 7 December 2007.

6.4 IPART's analysis

IPART notes Halcrow's findings (set out in 6.2) are based on the conclusion that Sydney Water has robust processes in place to generate its forecast of costs. However, IPART has identified considerable discrepancies in the data in Sydney Water's submission, the spreadsheet returns to IPART and the additional information provided to explain the reasons for expenditure changes over the last few years.

IPART recognises that there is some concern about how the plant should be operated once complete. The plant will operate at full capacity during the two year warranty period, so that any potential problems with the plant are uncovered during the warranty period. The longer term operation of the plant is not relevant to the determination period, but will need to be considered in more detail in the next determination.

As part of the 2005 Determination, IPART engaged Atkins/Cardno to conduct a similar review to that carried out by Halcrow in this review. Given that the Atkins review was only completed in February 2005 and covered a period to 2009, IPART has also taken those recommendations made by Atkins/Cardno into account in reaching its conclusions on the appropriate level of operating expenditure. IPART has also considered additional information provided by Sydney Water following Halcrow's review.

As explained in further detail below, IPART has made the following adjustments to Sydney Water's operating expenditure allowance:

- contributions to and reimbursements from the Climate Change Fund
- bulk water purchases from SCA
- adjustments for efficiency factors.

6.4.1 Climate Change Fund

Sydney Water is obliged to make annual contributions to the Climate Change Fund. Contributions are calculated as a lump sum payment plus expenditure on demand management activities. Sydney Water is reimbursed for demand management activities from the fund. IPART has, therefore, made adjustments for the reimbursements received or expected to be received by Sydney Water. The resultant impact on Sydney Water's operating expenditure is illustrated in Table 6.5 below.

6.4.2 Cost of bulk water from SCA

Sydney Water has forecast substantial increases in the cost of bulk water purchases from SCA. These increases reflect increased forecast water sales due to the removal of water restrictions, as well as increases in SCA's prices. Some of SCA's price increases are already reflected in IPART's 2005 Determination for SCA. However,

Sydney Water appears to have assumed additional price increases beyond SCA's current determination period.

IPART has adjusted the forecast cost of bulk water purchases from SCA to reflect the fact that SCA's prices are, as yet, unknown. IPART has assumed that SCA's prices beyond its current determination period will increase in line with increases in the Consumer Price Index (CPI). However, IPART considers that any adjustments to SCA's future prices as a result of its next determination should be 'passed-through' to Sydney Water's water prices to ensure that these prices reflect the cost of delivering water to customers. This issue was considered in Chapter 4 and will be included in the determination.

6.4.3 Efficiency proposals

In the review preceding the 2005 Determination, Atkins/Cardno suggested that there was scope for Sydney Water to achieve efficiency savings. This has been demonstrated by Sydney Water's under-expenditure in operating costs since the 2005 Determination.

Atkins/Cardno identified two types of efficiency savings. Continuing efficiencies are those that can be achieved by top performing agencies to improve their performance, being efficiencies across the industry sector stemming from innovation and new technologies. Catch-up efficiencies represent the scope for other agencies to achieve the performance of the top performing agencies.

In its submission Sydney Water highlights proposed efficiency savings over the determination period of $102 million in 2008/09 dollars.[37] IPART has investigated the factors contributing to these savings and has concluded that between 13 per cent and 39 per cent of the 'savings' relate to reductions in service and not efficiencies in the delivery of service. A further 15 per cent of the claimed savings have not been specifically identified, and so no conclusions can be drawn as to the validity of the identified amounts.

IPART considers that Sydney Water's operating expenditure should incorporate efficiency savings similar to those proposed by Atkins/Cardno while taking into account the efficiency savings that Sydney Water has proposed in its submission.

In terms of operating expenditure, IPART has applied a catch-up efficiency and a continuing efficiency. IPART is mindful of the efficiencies achieved by Sydney Water over the previous determination period and Halcrow's conclusion that Sydney Water is demonstrating evidence of a best practice water company. The proposed catch up efficiencies are therefore lower than those proposed by Atkins/Cardno. These are presented in Table 6.3 below.

[37] Sydney Water submission, September 2007, p 24.

Table 6.3 IPART's unadjusted operating efficiencies for Sydney Water

	Efficiency %			
	2008/09	**2009/10**	**2010/11**	**2011/12**
Continuing efficiency	0.8	0.8	0.8	0.8
Catch-up efficiency [a]	1.0	1.0	1.0	1.0
Combined efficiency	1.8	1.8	1.8	1.8
Cumulative effect	1.8	3.6	5.4	7.2

a Reduced to reflect already implemented improvements.

In its submission, Sydney Water notes that 38 per cent of operating costs are controllable. It contends that the remainder of its expenditure is made up of externally determined costs (36 per cent), fixed quantities outsourced costs (19 per cent) and efficient needs outsourced costs (7 per cent).

IPART has decided to apply the efficiency savings only to the controllable costs and to make allowance for efficiencies already identified by Sydney Water. The adjusted operating efficiencies are shown in Table 6.4. The adjusted efficiencies are calculated by: (1) multiplying the cumulative effect of the combined efficiency (from Table 6.3 above) by the percentage of costs that are controllable (ie, 38 per cent) to obtain the proposed efficiencies; and (2) subtracting an allowance for the efficiencies identified by Sydney Water from the proposed efficiencies.

Table 6.4 IPART's adjusted operating efficiencies for Sydney Water

	Cumulative efficiency %			
	2008/09	**2009/10**	**2010/11**	**2011/12**
Proposed efficiencies [a]	0.7	1.4	2.1	2.8
Allowance for Sydney Water identified efficiencies	-0.25	-1.6	-2.0	-2.2
Total efficiencies to be applied	0.45	0.0	0.0	0.6

a Adjusted to allow for controllable costs only (=38% multiplied by the cumulative effect of the combined efficiencies from Table 6.3 above)

In addition to this, there are a wide range of issues relating to the operating costs of the desalination plant that IPART will need to consider further at the next determination. Some of these issues were raised at the public hearing. For example, the UNESCO Centre for Membrane Science and Technology at the University of New South Wales (UNSW) also queried the sensitivity of total costs to assumptions regarding energy costs. However, these concerns were investigated by Halcrow and it was noted that Sydney Water have forecast expenditure on the advice of energy specialists.

6.5 IPART's decision on operating expenditure

IPART's decisions for the draft determination in relation to operating expenditure are presented in Table 6.5 below.

Table 6.5 IPART's finding on Sydney Water's operating expenditure ($million, real 2007/08)

	2008/09	2009/10	2010/11	2011/12	Total
Sydney Water proposed total	**984.3**	**1,028.8**	**1,048.1**	**1,041.1**	**4,102.4**
Halcrow total	**984.3**	**1,028.8**	**1,048.1**	**1,041.1**	**4,102.4**
IPART findings					
- Water (bulk water excluded)	410.0	406.5	397.4	387.0	**1,600.9**
- Bulk water costs	177.9	176.8	163.4	161.4	**679.5**
- Wastewater	388.5	383.3	377.6	376.2	**1,525.7**
- Stormwater	11.1	10.3	10.8	10.8	**43.0**
Subtotal	**987.4**	**977.0**	**949.3**	**935.4**	**3,849.1**
Desalination plant	0	27.5	53.4	53.7	**134.6**
Recycled water	0	3.3	7.8	10.4	**21.4**
Preliminary total	**987.4**	**1007.8**	**1010.5**	**999.5**	**4,005.1**
Alterations					
Less CCF reimbursement	-20.7	-22.2	-21.0	-17.0	**-80.9**
Less Rosehill/Camellia project	-0.0	-0.0	-0.2	-2.3	**-2.5**
Less Busby's Bore project	-0.0	-0.0	-0.0	-0.0	**-0.1**
Less operating efficiencies	-4.4	-0.0	-0.0	-5.6	**-10.1**
Total operating expenditure (excluding desalination capital amortisation costs)	**962.3**	**985.5**	**989.2**	**974.6**	**3,911.6**
Plus desalination capital amortisation costs	0	106.4	112.9	111.0	**330.3**
Total operating expenditure	**962.3**	**1,091.9**	**1,102.2**	**1,085.5**	**4,241.9**

Note: Figures differ from figures quoted in Table 5.1 due to clarifications and further detail received from Sydney Water within the Annual Information Return and other sources.

Note: Totals may not necessarily add up due to rounding. The desalination capital amortisation includes the return on capital and the depreciation charge. It is shown in the operating costs in this table, consistent with the treatment of the SCA's bulk water costs.

7 Assessment of Sydney Water's past and forecast capital expenditure

In determining a revenue requirement IPART must examine capital expenditure for two periods: the period since the last determination and the next determination period. A retrospective review of past capital expenditure enables IPART to consider whether capital expenditure has been prudent and should therefore be added to the Regulatory Asset Base (RAB). An assessment of the efficient forward capital costs enables IPART to formulate a revenue requirement for the next determination period.

IPART's findings on capital expenditure are summarised in this chapter, which also discusses:

- Sydney Water's historical and forecast capital expenditure
- Halcrow's review and recommendations on these forecasts
- stakeholders' submissions on Sydney Water's capital expenditure.

7.1 Sydney Water's submission

Sydney Water's submission notes that its capital expenditure in 2005/06 was approximately 12 per cent below that allowed for by IPART in the 2005 Determination, but that its actual expenditure in 2006/07 and 2007/08 is likely to be higher than that allowed for in that determination.

In the 2005 Determination Sydney Water was also required to report annually against a set of output measures or targets for the capital expenditure program for the period 2005/06 to 2008/09. Sydney Water has provided details of its performance against the targets in Attachment B of its submission. It notes that most targets will be met or exceeded and, importantly, critical assets will be renewed over the past two years.

Capital expenditure forecasts proposed by Sydney Water over the determination period are presented in Table 7.1 below. Capital expenditure is expected to rise substantially over the determination period, reflecting a number of large capital works projects. The capital expenditure program over the next four years can be broken down into the following main categories:

- the desalination plant and associated distribution pipelines, which is expected to cost around $1.8 billion, although $646 million of this will be incurred in 2007/08 (in 2008/09 dollars)

- the Replacement Flows Project, which is expected to cost approximately $250 million[38]
- recurrent capital expenditure necessary to maintain the network and comply with the requirements of its operating licence, which is expected to cost approximately $350 million per annum
- expenditure to service growth areas, which is expected to cost around $200 million per annum.[39]

Table 7.1 Sydney Water proposed capital expenditure, 2008/09 to 2011/12 ($m, real 2007/08)

	Total 2005/06-2008/09 2005 Determination	Total 2008/09-2011/12 Sydney Water proposed
Desalination	101	1,111
Recycled water	205	199
Other	2,325	2,727
TOTAL	**2,631**	**4,037**

Source: Sydney Water Submission, 14 September 2007.

7.2 Halcrow's review

As part of its assessment, IPART engaged Halcrow to review Sydney Water's capital expenditure program, paying particular regard to:

- current and future service outcomes and performance requirements
- how Sydney Water manages the risks associated with asset failure or underperformance
- the clarity of drivers for capital expenditure
- minimising costs over the life of the assets.

Halcrow was asked to comment on the prudence of the Sydney Water's capital expenditure for the period from 2005/06 to 2007/08 and to give an opinion on the efficiency of Sydney Water's capital expenditure program for the period from 2007/08 to 2012/13. It was also asked to identify the capital works projects associated with assets for which developers will either contribute to the cost of provision or will build and possibly hand over to Sydney Water.

[38] This scheme is intended to take sewerage from St Marys, Penrith and Quakers Hill sewage treatment plants to a new treatment plant in St Mary's. The treated sewerage from the plant will be used to replace environmental flow releases from Warragamba Dam and for use by industry, irrigation and new homes in Western Sydney.

[39] This has risen from approximately $83 million in 2005/06 and $155 million in 2007/08 (2008/09 dollars), as noted on p 4 of Sydney Water's submission. Note that when IPART calculates Sydney Water's revenue requirement, it deducts the revenue received from developer charges to ensure that other customers do not cross-subsidise the development of the growth areas.

In the case of the desalination plant and associated distribution pipeline, as well as the Replacement Flows Project, IPART's determination is limited to whether the proposed expenditure represents the efficient costs of meeting the Government's requirements.[40]

7.2.1 Asset management

Halcrow's review of Sydney Water's capital and operating expenditure delivery systems considered the processes used by Sydney Water to progress a project from its initial identification at the asset management plan level and its staged path through the business case process to obtain planning and investigation. It also examined the internal and semi-independent review process undertaken at various management levels and the final approval of the business case, at which point the project becomes part of the capital program.

From its review of these processes Halcrow obtained a reasonable level of confidence that the systems used by Sydney Water are robust and, when used throughout the organisation, would result in the development of an appropriate capital program.

7.2.2 Historical capital expenditure

Halcrow's review of Sydney Water's historical capital expenditure indicated that it has generally achieved the capital expenditure targets set out in the 2005 Determination. Over the period 2005/06 to 2007/08 Sydney Water's reported actual capital expenditure (excluding costs associated with the desalination plant) was $1,774 million compared to the expenditure target set for the same period of $1,891 million. This represents a variance from the expenditure targets of $34.5 million, or 1.8 per cent.

Halcrow concluded that, at an aggregate level, Sydney Water has generally achieved the capital expenditure targets set out in the 2005 Determination. However, there were some significant differences between targets and actual expenditure at a project level.

Halcrow also noted that Sydney Water has reported on the output measures that were set in the 2005 Determination to track delivery of Sydney Water's capital program over the period 2005/06 to 2008/09. Approximately 63 per cent of targets were met or exceeded, with 37 per cent of targets not being met.

7.2.3 Future capital expenditure

In making a judgment on future capital expenditure, Halcrow reviewed Sydney Water's capital expenditure delivery systems. Halcrow considered Sydney Water's asset management plan and processes to be close to best practice but believed that

40 As noted in Chapter 1, these projects have been declared under section 16A of the IPART Act.

there was likely to be scope for Sydney Water to improve its application of this plan and processes.

With respect to the desalination plant and recycled water projects, Halcrow identified that the procurement methods used demonstrated the most suitable means of achieving the most efficient capital expenditure costs in the market at the time. It also identified the use of an alliance contract to construct the delivery pipelines as an efficient method of accounting for uncertainties over the pipeline route and ground conditions.[41]

As already noted, Halcrow's approach for reviewing Sydney Water's proposed capital expenditure focused on the processes and systems used by Sydney Water to develop these expenditure programs. Halcrow conducted a review of Sydney Water's Capital Investment Program Delivery Systems and found that these systems were robust, detailed and appropriately took into account the specific issues identified in the scope of services. Based on these findings, Halcrow concluded that it was confident that the forecast future capital expenditure was efficient.

Halcrow did, however, raise concerns about the market's ability to undertake the volume of work being released by Sydney Water, especially with the desalination plant's construction phase in 2008/09 and part of 2009/10. For this reason, Halcrow proposed the deferral of an amount of approximately $100 million from 2008/09 capital expenditure and $150 million from 2009/10 capital expenditure in water and wastewater products. This $250 million of deferred expenditure would be allocated equally in proportions of approximately $125 million into 2010/11 and approximately $125 million into 2011/12. This smoothing would help reduce the peak of capital expenditure in 2008/09 (which is approximately $81 million higher than expenditure in 2007/08) and the peak in 2009/10 (which is $73 million higher than capital expenditure in 2008/09).

7.3 Stakeholders' submissions

IPART also invited submissions from other stakeholders on:

- the projected capital expenditure program
- the prudence of Sydney Water's past capital expenditure.

There were no stakeholders' submissions on these matters.

[41] An Alliance Contract is an agreement between parties (companies) to deliver projects in a mutually beneficial, non-adversarial environment. They generally incorporate collective responsibility for risk (allocated at the start of the project), performance and outcomes and can be for a single project or program of work. The agreement may also include the option to share any cost savings or overruns (pain/gain share).

7.4 IPART's analysis

IPART has reviewed the submissions by Sydney Water and considered Halcrow's conclusions. IPART notes that:

- There has been significant variation in the performance against output targets set at the 2005 Determination. As the targets for each of these measures were proposed by Sydney Water, IPART would have anticipated that they would have been achieved.
- There has been significant variation in the historical capital expenditure compared to the expenditure forecast in the 2005 Determination.

While IPART accepts the Halcrow's findings, it considers that there should be some adjustments to Halcrow's recommendations to take into account both IPART's views and some new information provided by Sydney Water. The adjustments are discussed more fully below.

The following sections outline IPART's findings on:

- the level of prudent historical capital expenditure to be rolled into the RAB
- the efficiency of Sydney Water's forecast expenditure for 2008 to 2011.

7.4.1 Prudence of past capital investment

Past capital expenditure that IPART deems to be prudent and forecast capital expenditure that it considers to be efficient are incorporated into the RAB when rolling it forward (to establish its value at the start of each year in the determination period). This figure is calculated net of growth capital expenditure funded by developers and disposals over the previous period.

In assessing the prudence of Sydney Water's past capital investment IPART has considered the initial and supplementary submissions of Sydney Water and the advice and recommendations received from Halcrow, and has conducted its own analysis of this material.

IPART has accepted Halcrow's general conclusions on the prudence of past capital expenditure. However, IPART has made a number of additional adjustments which reduces the level of past capital expenditure to be rolled forward into the RAB. These adjustments are discussed below.

Adjustment recycled water assets and past expenditure on the desalination plant

Decision

7 IPART's decision for the draft determination is to adjust the opening RAB downward by $150 million for works on the desalination plant that have been previously funded and recycled water assets that have previously been included.

Sydney Water has informed IPART that the current RAB value used by IPART at the 2005 Determination incorrectly includes the value of some recycled water assets. The adjustment required is a reduction of $44 million in the current year. This adjustment has been made and will be carried forward into this determination.

An additional adjustment is required to the RAB for the desalination plant. IPART's pricing decisions in the 2005 Determination allowed funding for Sydney Water to invest $94 million for preliminary work on a desalination plant for Sydney. The indexed value of $94 million in 2008/09 dollar terms is $106 million. IPART has adjusted the RAB for the desalination plant by this amount to account for the funding already received.

Capitalisation of borrowing costs

Decision

8 IPART's decision for the draft determination is to remove capitalised borrowing costs from Sydney Water's historical capital expenditure to be included in the RAB.

IPART's policy is to recognise capital expenditure in the year in which it is incurred. Recognising expenditure in the year in which it is incurred means that Sydney Water earns a return in the year the expenditure takes place.[42] Allowing Sydney Water to capitalise interest on historical expenditure as well is, in effect, double counting.

In its modelling and, contrary to IPART practice, Sydney Water has capitalised the costs of borrowing into historical capital expenditure to be used to establish the opening RAB value for the new determination period. However, Sydney Water does not capitalise its borrowing costs into capital expenditure when rolling forward the RAB.

IPART considers that the rate of return mechanism (discussed in the next chapter) should be used to recover borrowing costs and has determined that costs of borrowing should not be capitalised either for historic or forecast expenditure.

Disposals

Decision

9 IPART's decision for the draft determination is to reduce Sydney Water's opening RAB and the closing RAB in each year of the determination period by the annual amounts presented in Table 7.2 below.

Assets disposed of over time, both past and future, must be deducted from the RAB. In the past, IPART has used the disposals as recorded on the Profit and Loss Statement of Sydney Water, adjusted by the proportion of the regulatory value of the assets disposed of to that of the book value of the assets. For the 2005 Determination,

42 The calculation of the rate of return is discussed in section 8.2 and Appendix F.

this proportion was set at 55 per cent. Current levels of RAB and book value suggest a proportion of 75 per cent.

In its submission, Sydney Water uses the 55 per cent proportion but does not use the disposals from the Profit and Loss Statement. Instead, it uses only those assets sold for cash, omitting those abandoned or written off. The majority of assets sold for cash (99 per cent in 2008/09 and 86 per cent in 2009/10) comprise non-depreciating assets, namely land. IPART does not consider that the RAB to book value proportion should be applied to these disposal values. Given that those assets sold for cash are effectively valued at market value and cash is received for their sale, IPART considers that these disposals should be used at their 100 per cent value.

Following its submission, Sydney Water provided IPART with revised asset disposal figures as presented in Table 7.2 below.[43] It is noted that the assets disposed of for cash comprise 20 - 100 per cent[44] of the asset disposals.

Table 7.2 Disposals for cash ($millions nominal)

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Non-depreciable	7.9	11.5	66.2	118.8	28.5	48.8	5.0	5.0
Depreciable	0.4	0.4	0.1	81.6	0.3	7.7	0.0	0.0
Total	8.3	11.9	66.4	200.5	28.8	56.5	5.0	5.0

Source: Sydney Water.

7.4.2 Level of historical expenditure to be rolled into the RAB

Decision

10 IPART's decision for the draft determination is to allow into the RAB the level of historical capital expenditure detailed in Table 7.3 below.

Based on the adjustments noted above, the past capital expenditure to be rolled into the RAB is detailed in Table 7.3 below.

Table 7.3 Historical capital expenditure to be rolled into the RAB for Sydney Water ($million, nominal)

	2004/05	2005/06	2006/07	2007/08	Total
- Corporate	26.9	35.8	54.8	95.6	**213.1**
- Water	73.8	91.2	123.6	142.3	**431.0**
- Wastewater	290.9	299.2	382.3	377.1	**1,349.5**
- Stormwater	13.1	15.4	2.6	4.4	**35.6**
Subtotal	**404.7**	**441.7**	**563.3**	**619.4**	**2,029.1**
Desalination plant	0	57.1	41.8	678.7	**777.6**
Recycled water	0	0	6.2	36.8	**42.9**
Historical capital expenditure	**404.7**	**498.8**	**611.2**	**1,334.8**	**2,849.5**

43 Letter from Dr Kerry Schott, Sydney Water, 19 December 2007.
44 Except for the year 2007/08.

7.4.3 Efficiency of forecast expenditure for 2008 - 2011

IPART notes Halcrow's conclusions regarding the efficiency of Sydney Water's future capital expenditure and its proposal that Sydney Water defer some capital expenditure to the last years of the determination period. IPART does not support Halcrow's conclusions regarding the efficiency of Sydney Water's future capital expenditure. IPART has made a number of adjustments to Sydney Water's proposed capital expenditure to take into account efficiency factors as well as a number of adjustments arising from additional information provided by Sydney Water following the conclusion of Halcrow's review.

IPART, however, does accept Halcrow's recommendation that some capital expenditure be deferred to take into account of the ability of contractors to deliver Sydney Water's program of works.

Efficiency proposals

Decision

11 IPART's decision for the draft determination is to apply an efficiency adjustment to Sydney Water's proposed capital expenditure, as indicated in Table 7.5.

IPART proposes that the capital expenditure proposal should incorporate efficiency savings similar to those proposed in the 2005 Determination and take into account the efficiency savings that Sydney Water proposed in its submission. The proposed adjustments are discussed below.

For capital expenditure IPART has applied the same methodology as it applied to operating expenditure. As noted above, Halcrow considers Sydney Water's asset management plan and processes to be close to best practice but believes that there is likely to be scope for Sydney Water to improve its application of this plan and processes. For this reason, a catch-up efficiency has been applied to Sydney Water's capital expenditure. Table 7.4 outlines the efficiencies proposed by IPART for the draft determination.

Table 7.4 Proposed capital efficiencies

	Efficiency %			
	2008/09	**2009/10**	**2010/11**	**2011/12**
Continuing efficiency pa	0.5	0.5	0.5	0.5
Catch-up efficiency pa	1.0	1.0	1.0	1.0
Combined efficiency pa	1.5	1.5	1.5	1.5
Cumulative effect	1.5	3.0	4.5	6.0

Sydney Water has not specifically quantified efficiency savings for its capital expenditure program but its submission notes the use of alliance contracts, an improved governance framework and greater emphasis on performance outcomes

amongst efficiency innovations. IPART recognises that a proportion of Sydney Water's costs are already contracted. In recognition of this, and the fact that many efficiencies are already being implemented across the program, with the associated savings already accounted for, IPART has only applied the efficiency savings to that component of capital expenditure that is not contracted. Table 7.5 below shows the adjusted efficiency proposals.

Table 7.5 Adjusted capital efficiencies for Sydney Water

	2008/09	2009/10	2010/11	2011/12
% of capital expenditure that is contracted	50%	13%	3%	3%
Cumulative efficiency savings (%)	0.8%	2.6%	4.4%	5.8%
Cumulative efficiency savings (real 2007/08 $)	$4.5m	$14.7m	$31.3m	$43.4m

Year of allocation of capital expenditure

Decision

12 IPART's decision for the draft determination is to include in the RAB capital expenditure relating to the Sydney Desalination Plant (SDP) only once the plant is delivering water to customers (expected from 1 January 2010).

For the capital expenditure for the desalination plant and pipelines Sydney Water has proposed two different methods for the timing of receipt of revenue. For the water distribution infrastructure, Sydney Water proposes that it receive return on and of its investment as soon as it is spent, which includes the current financial year. For the desalination plant, it proposes that it begin recovering costs when the plant reaches practical completion and has begun to deliver water.

When applying the 'building block' approach, IPART's convention is to incorporate expenditures into the RAB as they are actually incurred. Sydney Water proposes that expenditures relating to the desalination plant and associated distribution infrastructure only be recovered from the year in which the plant comes into service.

There is no legal impediment to IPART incorporating the expenditures related to the desalination plant in the manner proposed by Sydney Water. IPART notes that the present value of the capital expenditure that is added to the RAB is the same whether it is incorporated into the 'building block' calculation when incurred or from practical completion. Therefore, the impact of Sydney Water's proposal is to reduce the price change experienced by customers in the first year of the determination. For this reason, IPART has adopted Sydney Water's proposal in relation to when capital expenditure related to the desalination plant is rolled into the RAB.

Inflating forecast capital expenditure

Decision

13 IPART's decision for the draft determination is not to support Sydney Water's proposal to escalate capital costs by the construction cost index and to use the CPI to inflate forecast capital cost.

In its submission to the 2005 Determination Sydney Water argued that the cost of capital projects was increasing faster than increases in the CPI. Sydney Water commissioned the engineering firm Evans and Peck Pty Ltd (Evans Peck) to investigate and forecast likely increases in construction costs. Evans Peck estimated that construction costs were likely to increase on average by 5.9 per cent per year, compared to forecast growth in CPI of 2.5 per cent per year. On this basis Sydney Water sought approval for real cost increases to be applied to its forecast capital expenditure.

IPART disagreed with Sydney Water's evidence and concluded that:[45]

> Having carefully considered the evidence available to it, the Tribunal believes that while there may be short-term variations in the rate of growth in the CPI and Total-Non-dwelling Construction costs, both of these price indices are likely to follow general movements in the Australian economy as a whole. With this in mind the Tribunal does not consider that the recent higher rate of growth in Total Non-dwelling Construction costs represents a long-term trend which requires special consideration in the 2005 determination period.

In the 2005 Determination, IPART also argued that, in the face of rising costs, all water agencies should reassess the costs/benefits of all the capital projects they have planned and defer those projects where increased costs exceeded likely benefits.

In its current submission Sydney Water again requests IPART escalate its forecast capital costs by the construction cost index. Sydney Water cites evidence that capital cost increases have been growing faster than CPI since the 2005 Determination. It argues that the average annual increase in the construction cost index from 2002/03 to 2006/07 was 5.8 per cent compared with a CPI of 2.7 per cent. Sydney Water has adjusted its future capital expenditure to incorporate a 5 per cent per annum adjustment to take into account future movements in construction costs.

Sydney Water also stated that:[46]

> In short, we have a program of works over the next 4 years involving the purchase of known real resources. The figures we have in our submission are our very best estimate of what we will actually have to pay to acquire those resources in dollars of the year. The appropriate value to add to the RAB to represent these outcomes is those nominal numbers discounted by CPI, since that is what the RAB is indexed by.

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45 IPART, *Sydney Water Corporation, Prices of Water Supply, Wastewater and Stormwater Services from 1 October 2005 to 30 June 2009 - Final Report*, June 2005, p 65.

46 Email from Alan Ramsay (Sydney Water) dated 7 February 2008.

IPART has investigated two Australian indices of construction costs to identify trends in the industry. These indices are collected by the Australian Bureau of Statistics (ABS) and include:

- Output of the General Construction Industry, which measures changes in prices by constructors during a quarter (excluding GST). The scope of this index includes the construction of residential and non-residential buildings, as well as non-building construction work.[47]
- Output of the non-building construction group which measures changes in prices charged by constructors during a quarter (excluding GST). Currently, the scope of this index only includes road and bridge construction, although coverage is later expected to include the class of non-building construction, which consists of railways, telecommunications, electricity infrastructure, etc.[48]

Table 7.6 below presents the rates of change for the different indices over the last eight quarters and the average change since June 2000.

Table 7.6 Comparison of ABS indices – year on year rates as at end of each quarter

	March 2006	June 2006	Sept 2006	Dec 2006	March 2007	June 2007	Sept 2007	Dec 2007	Average since June 2000
General construction (NSW)	3.9	3.1	2.8	2.7	2.5	2.3	1.9	2.1	**3.9**
Non-building construction (NSW)	4.8	4.8	5.1	5.0	4.8	4.6	4.1	4.0	**4.1**
Consumer Price Index	2.6	3.0	3.2	3.4	3.2	2.7	2.1	1.9	**3.1**

As indicated in Table 7.6, the rate of change of the general construction index is considerably lower throughout this period than the non-building construction index, although the averages over the longer term are relatively close. The rate of change in the general construction index is also lower than the rate of change in the CPI in some periods. Further, the rate of increase in all the indices has declined in each quarter of 2007.

IPART recognises that construction activity is predicted to remain strong in the near future. However, there are significant uncertainties in the global equity markets and credit markets that could have a negative impact on construction activity. Construction activity (and costs) could also be dampened by anticipated further increases in domestic interest rates, which would increase borrowing costs for businesses.

47 ABS Catalogue 6427.0, Table 15, subdivision 41, New South Wales.
48 ABS Catalogue 6427.0, Table 16, subdivision 412, New South Wales.

On balance, IPART has decided against Sydney Water's proposal to inflate the future capital expenditure by the construction cost index and, instead, proposes that this expenditure be escalated by the CPI.

In reaching this decision, IPART notes that the impact on Sydney Water is not likely to be significant for the following reasons:

- IPART has assumed future increases in CPI of 3.2 per cent per annum, which is above the 2.5 per cent CPI forecast used by Sydney Water.
- A large proportion of the Sydney Water's capital expenditure program relates to the desalination plant and recycled water schemes which have already been contracted.[49] Therefore, a large proportion of Sydney Water's projected capital expenditure in the first two years will not be exposed to future movements in construction costs.
- Under IPART's regulatory model, Sydney Water's actual prudent capital expenditure will be rolled into the RAB in the next determination. If Sydney Water's actual expenditure is lower than that allowed for in the determination, it will receive a windfall gain. If the actual expenditure is higher than that allowed for, it would incur a short term loss.[50] However, given that the majority of costs in 2008/09 and 2009/10 are already contracted, Sydney Water is only exposed to potential losses (or windfall gains) for the last two years of the determination period, after which the actual costs will be rolled into the RAB.

[49] In its submission, Sydney Water indicates that 80 per cent of its capital expenditure in 2008/09 has been contracted.

[50] This loss would be equivalent to the rate of return allowance on that the amount of expenditure above that allowed for in the determination.

7.4.4 IPART's findings on future capital expenditure

IPART's decisions in relation to Sydney Water's future capital expenditure are presented in Table 7.7 below.

Table 7.7 Capital expenditure for Sydney Water ($million, real 2007/08)

	2008/09	2009/10	2010/11	2011/12	Total
- Water	168.2	189.2	270.4	318.6	**946.4**
- Wastewater	379.7	364.1	424.5	418.4	**1586.6**
- Stormwater	12.1	12.8	16.0	11.0	**51.9**
Subtotal	**559.9**	**566.1**	**710.8**	**748.0**	**2,584.9**
Desalination plant	774.1	305.8	0.0	0.0	**1,079.9**
Recycled water	98.6	83.9	15.9	0.0	**198.5**
Preliminary total	**1,432.6**	**955.9**	**726.8**	**748.0**	**3,863.4**
Alterations					
Less Rosehill/Camellia projects	-0.0	-2.2	-15.9	-0.0	**-18.2**
Less Busby's Bore project	-1.1	-0.0	-0.0	-0.0	**-1.1**
Less efficiency savings	-4.5	-14.7	-31.3	-43.4	**-93.9**
Total capital expenditure	**1,426.6**	**938.5**	**679.6**	**704.7**	**3,749.3**

8 Findings on revenue requirement for capital investment

As set out in Chapter 5, the revenue requirement related to capital investment comprises two cost blocks: an allowance for a return **on** capital, and an allowance for a return **of** capital, or depreciation. Together, these allowances make up around 46 – 48 per cent of Sydney Water's total notional revenue requirement and, therefore, have a significant impact on water prices. IPART considered Sydney Water's revenue requirement for capital investment by:

- determining the value of its RAB for each year of the determination period, taking into account a range of factors, including its findings on the level of past capital expenditure that was prudent and forecast capital expenditure that is efficient (discussed in Chapter 7)
- determining an appropriate allowance for a return on assets by deciding on an appropriate rate of return and multiplying the opening value of the RAB by this rate
- determining an appropriate allowance for depreciation by determining the depreciation method and asset lives to be applied then calculating depreciation on the RAB.

This chapter explains IPART's findings on Sydney Water's revenue requirements for capital investment. Sections 8.1 to 8.2 explain the key inputs to those findings including IPART's findings on the methodology used in rolling forward the RAB and on the rate of return, depreciation method and asset lives applied in determining the allowances for a return on assets and depreciation.

8.1 Rolling forward Sydney Water's RAB

The RAB is the basis for determining the return on and of capital in the revenue requirement calculation based on the 'building block' approach. IPART determines the value of Sydney Water's RAB by rolling forward the opening value of its RAB at the 2005 Determination to reflect its findings on prudent actual capital expenditure over the 2005 Determination period and efficient forecast capital expenditure for 2008/09 to 2011/12. A number of other adjustments are required when rolling forward the RAB.

The next sections outline IPART's findings on:

- the methodology used in rolling forward the RAB
- the level of revenue that Sydney Water receives from developer charges ("capital contributions") to be deducted when rolling forward the RAB
- the level of asset disposals and regulatory depreciation to be included in the RAB
- the resulting values for each agency's RAB over the determination period.

8.1.1 Methodology used in rolling forward the RAB

Establishing the opening RAB for 1 July 2008

As in past reviews IPART determined the value of Sydney Water's opening RAB at 1 July 2008 by:

- Rolling forward the 1 July 2005 RAB to 30 June 2008 on the basis of actual prudent capital expenditure (related to both the existing system and for growth) over this period (as discussed in Chapter 7).[51]
- Deducting the actual capital contributions from the RAB each year from 2005/06 to 2007/08.[52]
- Deducting regulatory depreciation as allowed for in the 2005 Determination.[53]
- Deducting actual asset disposals in 2005/06 and 2006/07 and estimated disposals for 2007/08.
- Indexing the annual closing regulatory asset base for actual/forecast inflation. In making this calculation IPART assumes that half the capital expenditure and disposals occurs at the beginning of the year, therefore, receiving a full year of indexation. The remaining half of capital expenditure and disposals is assumed to occur at the end of the period and is not indexed.
- IPART's findings on level of capital contributions to be deducted when rolling forward the RAB.

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51 Given that actual expenditure for this year is not fully known at the time of the Determination, IPART has used the estimated expenditure for this year. This estimate has been assessed by IPART as part of the review and adjusted where appropriate. At the next review, the RAB will be adjusted to reflect the difference between this estimate and actual expenditure for 2007/08.

52 The effect of this is to remove investments made by developers from the RAB. This ensures that Sydney Water only earns a return on investments that it funds.

53 Regulatory depreciation refers to the depreciation amounts allowed for in the 2005 Determination. IPART uses regulatory depreciation, rather than actual depreciation, because the impact of any over/under-expenditure of capital expenditure during the determination period is limited to the return it earns on its expenditure. This provides agencies with an incentive not to overestimate their forecast expenditure at price reviews.

Rolling forward the RAB during the determination period

IPART rolls forward the RAB during the determination period (for each year from 1 July 2008 to 30 June 2011) by:

- Adding the forecast efficient capital expenditure (related to both the existing system and growth) in each year of the determination period to the closing value of the RAB for the previous year.
- Deducting the forecast capital contributions from the RAB each year from 2008/09 to 2011/12.[54]
- Deducting the regulatory depreciation in each year of the determination.
- Deducting forecast disposals of assets in each year of the determination.
- Indexing the annual closing RAB for forecast inflation. Similar to the approach of establishing the opening RAB, IPART assumes that half the capital expenditure and disposals occur at the beginning of the year (receiving a full year of indexation), with the remainder occurring at the end of the year.

This methodology is the same as that used in rolling forward the RAB for the 2005 Determination.

8.1.2 Adjustments for capital contributions

As noted above, IPART deducts the value of any capital contributions from the prudent actual and forecast capital expenditure it incorporates when rolling forward the RAB. 'Capital contributions' refers to the revenue Sydney Water receives from developers in accordance with IPART's *Determination No 9, 2000, Developer Charges from 1 October 2000*.

Sydney Water has reported the level of cash contributions made by developers in its Information Returns provided to IPART for this review. IPART has adopted Sydney Water's forecasts for developer capital contributions, as presented in Table 8.1 below.

Table 8.1 Cash capital contributions ($millions)

	2004/05 nominal	2005/06 nominal	2006/07 nominal	2007/08 nominal	2008/09 real 08 $	2009/10 real 08 $	2010/11 real 08 $	2011/12 real 08 $
Water	12.1	14.7	13.2	12.9	12.6	13.7	13.6	13.6
Wastewater	27.2	31.1	28.9	35.6	34.7	38.9	39.8	40.2
Stormwater	2.1	3.4	2.7	3.5	3.4	3.6	4.7	4.6

[54] Depending on the rate of development, differences may arise between the actual developer charge receipts and those forecast in the Development Service Plans.

8.1.3 Adjustments for disposal of assets

Asset disposals over time, both past and future, need to be deducted from the RAB. In the past, IPART has used the asset disposals as recorded on the Profit and Loss Statement of the agency, adjusted by the proportion of the regulatory value of the asset disposals to that of the book value of the assets.[55]

Following its submission, Sydney Water has provided revised data on asset disposals.[56] The revised data partly reflects adjustments for the sale of Sydney Water's head office which was finalised in January 2008 for a price of $140 million. IPART has used the revised data, as presented in Table 8.2 below, to adjust the RAB.

Table 8.2 Disposals for cash ($millions, nominal)

	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Non-depreciable	7.9	11.5	66.2	118.8	28.5	48.8	5.0	5.0
Depreciable	0.4	0.4	0.1	81.6	0.3	7.7	0.0	0.0
Total	8.3	11.9	66.4	200.5	28.8	56.5	5.0	5.0

8.1.4 Adjustments for depreciation

The allowance for a return of capital, or depreciation, represents the revenue Sydney Water requires to maintain the value of its assets. Depreciation represents around 7 to 10 per cent of Sydney Water's total notional revenue requirement.

Depreciation is largely a function of the value assigned to Sydney Water's assets and the expected life of those assets. In calculating depreciation, expected asset lives are applied to new assets and weighted average remaining asset lives are applied to existing assets.

In relation to the historical depreciation to be included in the opening RAB, IPART has used the amounts allowed for at the 2005 Determination.

For future depreciation, IPART has conducted further analysis following Sydney Water's submission. In past determinations IPART has generally used the straight-line depreciation method to calculate the return of capital (depreciation) allowance for Sydney Water. IPART believes that this approach is superior to alternatives in terms of simplicity, consistency and transparency. It therefore supports the continued use of this approach for the current review.

IPART has made findings on the depreciation method and the asset lives to be applied, as discussed further below.

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55 For the 2005 determination, this proportion was set to 55 per cent. Current levels of RAB and book value suggest a proportion of 75 per cent.

56 Letter from Managing Director of Sydney Water, 19 December 2007.

Asset lives to be applied

In its submission Sydney Water raised a number of issues in relation to the lives of assets adopted by IPART.

IPART engaged Halcrow to undertake a review of Sydney Water's estimates of its asset lives to assist IPART in its assessment of the appropriate period over which to amortise Sydney Water's investments.

Currently IPART uses an average asset life based on the asset groups of water, wastewater and stormwater assets. In its submission to this review Sydney Water requests that the asset groups be broken down further to more accurately reflect the mix of asset types it holds.

Sydney Water's submission outlines a case for applying different asset lives for different classes of assets. The quoted remaining asset lives range between 8 years for electronic assets and 87 years for civil wastewater assets.

In modelling the regulatory depreciation for 2008/09 Sydney Water estimates that under current arrangements the depreciation value would be $134 million compared to $149 million using actual remaining asset lives. Sydney Water states that this results in the expenses allocated to consumers being lower than the actual cost of providing the service, leading to over-stated profits and higher taxes. It would also lead to an understatement of the income requirement.

Halcrow's findings on asset lives

Halcrow reviewed the asset lives of pipelines with specific reference to Sydney Water's asset management plans. The lives assigned by Sydney Water for water and wastewater pipes were compared to typical lives used in Australia. In general, Halcrow has recommended that IPART use longer asset lives for water mains than those submitted by Sydney Water.

With respect to the asset lives for the above ground system assets (treatment plants, pumping stations, reservoirs) Halcrow found that Sydney Water's asset lives were high in comparison. However, it did not suggest Sydney Water should reduce their assumed asset lives for these assets as condition assessments will capture any errors and the remaining asset life will be adjusted accordingly. Halcrow concluded that the average asset lives for above ground systems were appropriate for use by IPART in its assessment.

With respect to asset classes Halcrow concluded that Sydney Water's current asset classes were acceptable for use by IPART.

Stakeholder's submissions on asset lives

In its Issues Paper IPART sought stakeholder comments on the appropriate asset lives to apply for calculating Sydney Water's depreciation charge for the price determination.

IPART received one submission from the UNESCO Centre for Membrane Science and Technology at UNSW that queried the proposed asset lives for the desalination plant compared to other asset lives used by Sydney Water. UNSW asserts that firstly, the asset lives proposed for the desalination plant are not consistent with other asset lives proposed by Sydney Water. Secondly, that the operating environment of the desalination plant is more aggressive that Sydney Water's existing assets. UNSW concludes that the use of optimistic asset lives could impact the financial viability of the plant and require the replacement of key components sooner than expected.

IPART's analysis

IPART considers that Sydney Water's proposal to apply different asset lives to the different asset classes is a step forward from the approach previously applied to regulatory depreciation because it allows a more accurate assessment of the efficient recovery of investment over the life of the asset.

In order to apply segregated asset lives to the value of the RAB, Halcrow has completed a spreadsheet allocating weighted average remaining asset lives to the existing asset base and weighted average asset lives to the capital expenditure over the forthcoming determination.

For this determination, IPART has decided to calculate depreciation using the asset lives shown in Tables 8.3 and 8.4 below. These figures more accurately reflect the remaining asset lives compared to the past aggregated approach.

Table 8.3 Remaining asset lives for existing assets

		Proposed remaining asset lives
Water (conventional potable)	Civil	86
	Mechanical	32
	Electrical	17
	Electronic	8
Wastewater	Civil	87
	Mechanical	21
	Electrical	19
	Electronic	8
Stormwater	Civil	116
	Mechanical	7
	Electrical	0
	Electronic	5
Water (recycled)	Civil	86
	Mechanical	32
	Electrical	17
	Electronic	8

Note: For the existing RAB corporate assets are allocated across the water, wastewater and stormwater categories.

Table 8.4 Asset lives for new assets

			Sydney Water	Halcrow	IPART
Corporate	Water	Civil	74	74	
		Mechanical	8	8	
		Electrical			
		Electronic	7	7	
	Wastewater	Civil	63	63	
		Mechanical	8	8	
		Electrical			
		Electronic	5	5	
	Stormwater	Civil	87	87	
		Mechanical			
		Electrical			
		Electronic	5	5	
	All[a]	Civil			68
		Mechanical			8
		Electrical			
		Electronic			6
Water (conventional potable)		Civil	99	140	140
		Mechanical	37	40	40
		Electrical	37	30	30
		Electronic	14	15	15
Wastewater		Civil	83	90	90
		Mechanical	25	25	25
		Electrical	25	25	25
		Electronic	13	15	15
Stormwater		Civil	150	150	150
		Mechanical		25	25
		Electrical		25	25
		Electronic		15	15
Water (recycled)		Civil	99	140	140
		Mechanical	37	40	40
		Electrical	37	30	30
		Electronic	14	15	15
Desalination plant		Plant	30		
		Concentrate outlet system	100		
		Seawater intake system	90		
		Pumping station	25		
		Civil			90
		Mechanical			15
		Electrical			20
		Electronic			15

[a] Calculated as weighted averages using the capital expenditure allocations provided by Halcrow.

In the course of the review, Halcrow has also confirmed that Sydney Water's asset lives for existing assets were acceptable and did not suggest alternatives. IPART proposes to adopt Sydney Water's submitted remaining asset lives for existing assets.

Applying IPART's draft Determination on asset lives provides an annual depreciation allowance for Sydney Water. Sydney Water's submission does not separately identify these figures in the same format as IPART's calculations that would allow a direct comparison. However, using data in Sydney Water's submission IPART's calculations indicate that this draft Determination will result in

an annual depreciation allowance that is approximately 1 per cent lower than that sought by Sydney Water.

8.1.5 Resulting value for RAB

Following the above adjustments and allowing for indexation of the closing RAB for forecast inflation.

Table 8.5 RAB for Sydney Water ($million, real 2007/08)

	2008/09	2009/10	2010/11	2011/12
- Corporate	76.5	138.2	186.2	231.7
- Water (including desalination plant)	3,737.54	5,198.76	5,323.58	5,476.92
- Wastewater	6,517.5	6,672.6	6,903.7	7,122.3
- Stormwater	206.5	212.5	220.4	223.6
Total	**10,538.01**	**12,222.03**	**12,633.91**	**13,054.43**

8.2 Rate of return on Sydney Water's RAB

There are several approaches for calculating the appropriate rate of return on the RAB. IPART's preferred approach is to use the WACC to determine an appropriate rate of return range. As with previous determinations, IPART has used a real pre-tax WACC. The WACC is a weighted average of the cost of debt and equity. IPART has used the Capital Asset Pricing Model (CAPM) to derive the cost of equity, and calculated the cost of debt as a margin over the risk free rate.

In making its finding on the rate of return, IPART has exercised its judgment to determine the rate of return, taking into consideration the requirements of the IPART Act – particularly s 15(1)(b) dealing with the protection of consumers from abuses of monopoly power; s 15(1)(c) dealing with an appropriate rate of return including payment of dividends and s 15(1)(k) dealing with the social impact of its determinations and recommendations. It investigated the implications of its chosen rate of return on the average bills paid by customers with differing characteristics, and on the financial viability of the businesses estimated by changes in key financial ratios.

The following sections outline the comments in the submissions and IPART's findings on the rate of return for Sydney Water. IPART's considerations on each of the parameters used to calculate the WACC range are set out in Appendix F.

8.2.1 Sydney Water's submission

In its submission Sydney Water proposes a real pre-tax rate of return of at least 7 per cent. Its central argument is that it faces higher levels of revenue and demand risk than other network utilities such as the electricity sector and should therefore be compensated through a higher rate of return than in its past determinations.

Sydney Water argues that the 6.5 per cent real pre-tax WACC allowance in the 2005 Determination was lower than that afforded to either the NSW Electricity Distribution businesses in 2004 or AGL's Gas Network (now Alinta) in 2005, which both received 7 per cent. Appendix F of Sydney Water's submission deals with some of the specific WACC parameters in more detail.

Sydney Water argues that its revenue risk is asymmetric compared to economy-wide systematic risk because it is subjected to fixed price cap regulation. It therefore argues that it faces a higher revenue and earnings volatility since under fixed price cap regulation, its demand forecasts are not adjusted over the determination period for unexpected decreases in demand. In order to demonstrate the level of revenue risk, Sydney Water has presented data in terms of its earnings volatility (ie, the relative differences between its forecast and actual revenues) compared to more the stable and higher returns of a select number of energy network businesses.

Further, Sydney Water asserts that ongoing drought conditions and associated water restrictions mean that it has experienced more revenue and earnings volatility than the energy network businesses and that this volatility is expected to continue. Consequently, Sydney Water states that it has not achieved its WACC (6.5 per cent real pre-tax) since 2002/03.

8.2.2 Other stakeholder's submission

Alinta's submission was the only other submission that commented on Sydney Water's rate of return. Alinta, in general, has endorsed the approach adopted in IPART's 2005 Metropolitan Water Determination for calculating Sydney Water's rate of return. However, it believes that for this review, IPART should correct for anomalies and biases in the risk free rates and debt margin parameters as identified by recent empirical work undertaken by consultants in other Australian jurisdictions.

To this end, Alinta has attached to its submission a report by economic consultants NERA Economic Consulting on biases in risk free rates. It also refers to work undertaken by The Allen Consulting Group (ACG) for Essential Services Commission of Victoria on biases in debt margins that rely on CBASpectrum data. Relying on these reports, Alinta submits that the risk free rate parameters should be adjusted because:

- There is a relative (downward) bias between the yields on real (ie, indexed) and nominal government bonds. The bias of approximately 20 basis points is a result of structural changes in the market for government bonds that have increased institutional demand for the real government bonds at a time of limited supply of these instruments.
- There is an absolute (downward) bias in yields on both real and nominal government bonds. This bias is estimated at 66 basis points at March 2007.

Alinta also submits that the debt margin allowance should be adjusted because the CBASpectrum data that is relied on for estimating the debt margin consistently understates the true value of the yield, and that the bias increases as the term of the debt increases and its rating decreases as a result of the methodology used by CBASpectrum.

Consequently, Alinta states that IPART should:[57]

> …correct for both of these identified biases and generally, to the extent that it has discretion, to err on the high side when determining the WACC to ensure that [Sydney Water] has an adequate incentive to invest and that there is competitive neutrality between [Sydney Water] and private sector providers, recognising that Government policy seeks to encourage private sector participation in the water services industry.

8.2.3 Summary of IPART's findings on the rate of return

IPART's finding is that for the purposes of calculating the allowance for a return on assets, a real pre-tax rate of return of 7.1 per cent will be applied. This finding reflects IPART's view that the industry weighted average cost of capital is in the range of 6.3 to 8.1 per cent. Note, however, that IPART will recalculate the rate of return for the final determination to take account of changing market conditions.

The parameters IPART used to calculate this WACC range are shown in Table 8.6 and were based on market conditions as at 18 December 2007. IPART recognises that there has been significant volatility in financial markets since 18 December 2007 and there is likely to be continued volatility in the near future. Prior to its final determination IPART will update the WACC parameters to reflect the market conditions at that time.

A detailed discussion of IPART's findings is presented in Appendix F.

[57] Alinta submission, 12 October 2007, p 3.

Table 8.6 Rate of return range and parameters – IPART's decision for the draft determination

WACC Parameters	Market values
Nominal risk free rate	5.99%
Real risk free rate	2.76%
Inflation	3.14%
Market risk premium	5.5 - 6.5%
Debt margin	1.9 2– 2.51%
Debt to total assets	60%
Dividend imputation factor (gamma)	0.5 – 0.3
Tax rate	30%
Equity beta	0.8 – 1.0
Cost of equity (nominal post-tax)	10.39 – 12.49%
Cost of equity (nominal pre-tax)	7.91 – 8.50%
WACC range (real pre-tax)	6.29 – 8.03%
WACC (real pre-tax) midpoint	**7.1%**

Note: The midpoint WACC is calculated using the midpoint of each of the parameters.

8.3 Summary of IPART's decisions on revenue requirement for capital investment

The impact of applying IPART's decisions is shown in Table 8.7.

Table 8.7 Impact of applying IPART's decisions ($millions, real 2007/08)

	2008/9	2009/10	2010/11	2011/12	Total
Sydney Water's return on and of capital	893	924	980	1,030	3,827
IPART's return on and of capital [a]	840	902	953	1,000	3,695
Difference in return on and of capital	-53	-22	-27	-30	-132
% difference	-6.0%	-2.3%	-2.8%	-2.9%	-3.4%

a Sum of return on working capital, return on fixed assets and depreciation from Table 5.2.

9 Findings on forecast metered water sales and customer numbers

In the course of its review IPART needed to consider Sydney Water's forecast metered water sales and customer numbers for two reasons:

- Under the 'building block' approach for calculating notional revenue requirements, underlying assumptions about how demand for water and wastewater services will grow over the determination period affect Sydney Water's forecast capital and operating costs. IPART's findings on efficient levels of capital and operating expenditure need to reflect reasonable assumptions about this growth.
- Once IPART has decided on the revenue requirement for Sydney Water, it sets the prices of individual services taking into account this revenue requirement and forecast water sales and customer numbers. If the forecasts are not reasonable, there is a risk that the prices IPART sets will lead to Sydney Water significantly over or under recovering its required revenue.

IPART engaged MMA to undertake an independent review of Sydney Water's water consumption forecasts over the next five years, to comment on the robustness of the approach used to develop these forecasts and to advise on to the reasonableness of the assumptions used in preparing the forecasts.

MMA's report analysed Sydney Water's forecasting methodology (including the use of baseline forecasts) and the reasonableness of water savings from water restrictions and demand management programs.

9.1 Summary of Sydney Water's submission

Sydney Water has quantified the value of its proposed fixed charges by forecasting the number of connected properties over the determination period. Residential property forecasts are based on figures published by the Department of Planning. Non-residential property numbers are forecast based on average development rates and lot sizes over the previous 10 years, and consider the remaining development potential in Sydney.

Sydney Water's submission quotes that, by 30 June 2012, around 100,000 new residential properties and 3,800 new non-residential properties will connect to Sydney Water's water and wastewater systems.

Sydney Water's forecasting methodology uses an estimate of 426 litres per capita per day (LCD) as its bulk water baseline demand. This estimate was derived for planning purposes and to assess the impacts of various options for demand management and supply augmentation. The estimate was based on actual consumption during the late 1990s when no drought restrictions applied. It was determined after correcting these figures for weather conditions and is assumed to have remained stable over time.

Sydney Water's forecast metered potable water sales are shown in Table 9.1 and incorporate the following assumptions:

- Level 3 and 2 water restrictions will be lifted during 2007/08 and Level 1 water restrictions will apply in 2008/09
- permanent water savings will apply from 2009/10 to 2011/12
- once Level 1 restrictions are lifted, demand will gradually change to levels that include permanent water savings over the financial year
- Sydney Water will meet its operating licence demand management targets.

Table 9.1 Sydney Water's historical and forecast consumption (GL)

GL pa	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12
Total metered residential treated water sales	328.6	325.1	318.4	313.3	327.0	359.0	355.1	352.9
Total metered non residential treated water sales	135.8	135.5	129.6	129.4	131.5	140.5	131.0	124.6
Total consumption (including losses)	526.4	526.9	515.3	505.1	519.4	560.0	544.1	534.5

Source: Sydney Water Annual Information Return.

9.2 Summary of MMA's findings

MMA's preliminary task was to review Sydney Water's water consumption forecasts from 2008/09 to 2011/12. This review analysed Sydney Water's forecasting methodology and assessed the likely water savings from water restrictions and demand management programs. MMA also investigated the validity of the assumptions used by Sydney Water in the preparation of its consumption forecasts.

Baseline methodology

MMA's report identified that the baseline consumption forecast for the residential sector was based on historical consumption data and projections of dwellings growth for the relevant property types. The forecast of baseline non-revenue water was based on historical estimates of non-revenue water, estimated savings from leak reduction programs to date and the growth in leakage from its water supply system in the absence of leak reduction activities.

The baseline non-residential consumption is estimated as the difference between the baseline bulk consumption forecast and the sectoral forecasts for residential properties and non-revenue water.

MMA reported that there were several limitations in Sydney Water's approach to the forecasting of baseline consumption that may restrict that approach as a tool for demand forecasting. These limitations include the following:

- Difficulties in estimating monthly population growth, which leads to errors in the LCD calculated for each month.
- The fact that trends in the LCD mask a large number of other trends, such as reductions in industrial demand and leakage.
- Problems arising from the fact that estimates of the trend variable is not robust and is likely to change over time as the interplay of underlying trends change.
- Adoption of the assumption that average per capita consumption remains constant at 426 LCD, which implies that water consumption patterns remain constant relative to the population.
- Changes in the structure of industry resulting in:
  - the growth of service industries offset by the decline of manufacturing
  - large decreases in industrial water demand over the last 20 years as industry moves to more water efficient means of production in response to water scarcity and pricing signals
  - the introduction of water recycling leading to lower potable water consumption in industry.
- Estimates of the trend in LCD are also highly sensitive to the specification of weather variables. The specification used by Sydney Water was based on analysis undertaken by a weather correction model. Previous analysis by MMA has indicated that even slight changes to this specification result in different trend parameters.

Impact of water restrictions

MMA assessed the impact of water restrictions and concluded that Sydney Water's methodology provided a reasonable assessment of their impact. MMA's assessment indicated that restrictions had a significant impact on water consumption.

It agreed with Sydney Water's findings regarding the level of water savings resulting from Level 1 restrictions. The results obtained for Levels 2 and 3 restrictions are affected by the presence of demand management programs but do indicate that higher levels of restrictions reduce water consumption more than Level 1. However, the extent of the impact is ambiguous.

Demand management programs

MMA conducted a detailed assessment of the impact of a range of demand management programs initiated by various Government departments and Sydney Water. MMA concluded that most of the assumptions used by Sydney Water in assessing the impact of these programs were reasonable and that the methodologies used to estimate water savings were appropriate. In certain areas, however, there were minor differences in opinion, mainly regarding the speed at which certain measures will be taken up and, in some cases, uncertainty over the ability to determine participant behaviour. However, MMA notes that significant uncertainties still exist in determining a number of these estimates, especially for some of the largest programs, including:

- long-term water saving rules, which is expected to save over 19 GL by 2011/12
- recycled water, which is estimated to save over 30 GL by 2011/12
- active leak detection saving of about 22 GL pa over the determination period.

Forecast of water consumption

MMA's review of the water savings under various demand management and restriction regimes indicates that Sydney Water's forecast appears to be reasonable. Table 9.2 also shows the difference between Sydney Water's forecast and MMA's review of Sydney Water's forecast. The forecasts provided by Sydney Water do not exhibit any significant step changes from recent consumption history. In the previous three years, actual total water consumption averaged around 522 GL, with 515 GL consumed in 2006/07. The 2007/08 forecast provided by Sydney Water is within 2 per cent of the average consumption from the last three years. Given the other uncertainties inherent in these forecasts, the differences between Sydney Water's forecast and MMA's assessment are not significant.

Table 9.2 MMA's forecast of demand management programs

	2007/08	2008/09	2009/10	2010/11	2011/12
Bulk baseline	673,877	678,243	684,486	690,743	698,575
less restrictions	97,564	74,083			
less LTWSR			35,040	27,432	19,190
DM programs					
WaterFix incl. DOH WaterFix	9,178	9,479	9,730	9,980	10,231
DIY	739	875	904	933	948
Washing machine rebate	1,597	2,022	2,022	2,022	2,022
Rainwater tank rebate	1,847	2,421	3,019	3,641	4,288
Love your garden	1,029	2,013	2,948	3,663	3,923
Business programs	13,386	17,026	21,247	24,652	26,846
Small business retrofit		202	686	1,211	1,533
Spray valves rebate	63	285	601	790	822
EDC in schools	54	63	72	81	90
Rainwater tanks in schools	41	68	115	163	186
Govt water efficiency	94	283	471	565	565
Recycled water savings	11,999	13,950	17,174	24,757	31,281
WELS	581	1,959	4,667	8,146	11,857
BASIX adjusted for recycled water saving	2,736	5,689	9,593	11,854	14,066
Pilot water saving programs	166	339	473	505	521
Active leak detection	21,171	21,901	21,901	21,901	21,901
Pressure management	1,122	2,813	3,986	4,956	5,276
Improved leak/break response times	730	730	730	730	730
Forecast water consumption (ML)	509,781	522,043	549,107	542,761	542,299
Sydney Water forecast (ML)	505,085	519,371	560,039	544,082	534,465
Difference (ML)	4,696	2,672	-10,932	-1,321	7,834
Difference (%)	0.9%	0.5%	-2.0%	-0.2%	1.4%

Note: The peak demand in 2009/10 is a result of the removal of restrictions and the introduction of long term water savings. The decline from this date is as a result of the increasing impact of demand management programs.

Source: MMA, *Report to Independent Pricing and Regulatory Tribunal. Review of Consumption for Sydney Water Corporation,* 3 March 2008.

MMA's proposed forecasts

MMA undertook the independent forecast based on a methodology that sought to isolate the impact of any demand management programs. To accomplish this Sydney Water provided an estimate of the impact of all the demand management programs since inception and adding back the savings to the water consumption. The total consumption quantities were then converted to a per capita consumption amount by dividing by the population served by Sydney Water. A regression equation was then estimated with the per capita consumption as the dependent variable with the following independent variables:

- seasonal index for each quarter
- net evaporation rate (evaporation rate – rainfall) over a quarter
- number of rain days (rainfall >1mm) over a quarter
- number of days per quarter where temperature exceed 30°C
- average marginal price of water
- where Levels 1 – 3 restrictions apply
- where Levels 2 – 3 restrictions apply
- where Level 3 restrictions apply.

Bulk water forecast

The base demand for bulk water was calculated based on the results of the regression analysis. The values of the forecast variables applied to the analysis are based on data supplied by Sydney Water and the Australian Bureau of Metrology.

The estimated daily per capita bulk consumption was multiplied by the expected population served by Sydney Water to produce the bulk base demand. This bulk base demand is an indication of the climate corrected demand based on average weather conditions in the absence of any demand management measures but includes the impact of restrictions that are expected to apply in 2008 (Level 2) and 2009 (Level 1). The effect of any relaxation of restrictions was modelled to decay at a 50 per cent rate over 6 months (September and December quarters) to simulate the delay in behavioural change as restrictions are removed.

Savings from the demand management programs were subtracted from the base demand. Since the independent forecast produced a lower per capita consumption, savings from the demand management programs were reduced to acknowledge that the opportunities for savings would be reduced.

Residential demand

Regression analysis, using annual data, was used to estimate the residential sector base per capita water consumption.

Only net evaporation rates were found to be significant for residential demand. Other climatic variables are not significant. The analysis also found that while restrictions do impact consumption, there was no statistically significant difference between the impact of different levels of restrictions on consumption. As a result, combined restrictions were assumed to apply until June 2009.

The resulting estimated daily per capita residential demand was then multiplied by the estimated population to determine the estimated base residential demand. This produced a climate corrected demand under restrictions prior to the application of demand management measures. Savings from demand management programs targeted at the residential sector were then subtracted from the base annual demand after adjustments were made to the saving expected due to the lower base demand.

MMA's forecast concluded that there has been significant behavioural change that had occurred since Sydney Water first estimated their base consumption. This is likely to have occurred as a result of publicity about the need to save water and the change in public consciousness due to the impact of the long drought.

Non-residential demand

Again the estimation of the non-residential demand was based on regression analysis to estimate the base per capita consumption from the non-residential sector. As weather conditions were not shown to affect non-residential demand significantly, no weather variables were included in the forecasting equation. However, different restriction levels were shown to be significant and were included.

The estimated non-residential per capita demand was then multiplied by the estimated Sydney Water population to determine the estimated base non-residential demand. Savings from demand management programs targeted at the non-residential sector were then subtracted from the base annual demand to produce the forecast non-residential demand.

MMA's forecast of non-residential water consumption is higher than Sydney Water's forecast. This could reflect the more recent higher economic growth of the Sydney economy resulting in higher water consumption despite the measures taken by businesses to reduce consumption.

The outputs from MMA's independent forecasts are shown in Table 9.3.

Table 9.3 MMA's independent forecasts

ML pa	2008/09	2009/10	2010/11	2011/12
Total metered residential treated water sales	319,823	331,796	335,727	340,639
Total metered non residential treated water sales	138,084	145,793	136,394	129,366
Total consumption (including losses)	508,072	533,061	526,334	515,504

Source: MMA, *Report to Independent Pricing and Regulatory Tribunal. Review of Consumption for Sydney Water Corporation*, 3 March 2008.

MMA noted that there were some shortcomings in the input data that result in a lower level of confidence in the forecasts. The main deficiency was that there were only fifteen years of annual data for the sectoral analysis, compared to quarterly data for the bulk water forecasts.

MMA explained the main differences between its forecasts and Sydney Water's forecasts as the result of differences in the assumptions for the introduction of long term water saving rules once restrictions have been lifted. While Sydney Water's submission notes that demand will take some time to adjust to the new rules, MMA's modelling has assumed that public behaviour will take longer still to adjust.

9.3 Stakeholders' submissions

It was noted in several submissions that the reduction in sales, cited by Sydney Water as the cause of its current financial position, is merely in line with the operating licence targets Sydney Water should be adhering to, and that sales forecasts should not be above these levels. It was also noted that prices should not be based on infrastructure costs because this allows Sydney Water to increase supply above operating licence targets.

However, IPART notes that the operating licence target has been set at 329 LCD for the year ending June 2011 only, and that there are no intermediate targets. In addition, IPART did not incorporate restrictions into the consumption forecasts in the 2005 Determination as it was considered that they were short term and that doing so might allow Sydney Water to make unreasonable profits once the restrictions were lifted. As a consequence, Sydney Water actual sales for the period 2005 – 2008 have been lower than IPART's projected figures.

9.4 IPART's analysis

IPART has analysed the differences between the consumption forecasts prepared by Sydney Water and MMA. The differences are summarised in Table 9.4.

Table 9.4 Comparison between Sydney Water and MMA forecasts

ML pa	2008/09	2009/10	2010/11	2011/12	Total
Sydney Water					
Total metered residential treated water sales	327,010	358,996	355,144	352,907	1,394,057
Total metered non residential treated water sales	131,489	140,515	130,994	124,603	527,601
Implied other water consumption	60,872	60,528	57,944	56,955	236,299
Total consumption (including losses)	519,371	560,039	544,082	534,465	2,157,957
MMA					
Total metered residential treated water sales	319,823	331,796	335,727	340,639	1,327,985
Total metered non residential treated water sales	138,084	145,793	136,394	129,366	549,637
Implied other water consumption	50,165	55,472	54,213	45,499	205,349
Total consumption (including losses)	508,072	533,061	526,334	515,504	2,082,971
Difference					
Total metered residential treated water sales	7,187	27,199	19,417	12,268	66,071
Total metered non residential treated water sales	-6,595	-5,278	-5,400	-4,763	-22,036
Implied other water consumption	10,707	5,056	3,731	11,456	30,950
Total consumption (including losses)	11,299	26,978	17,748	18,961	74,986
Net difference in metered sales	592	21,921	14,017	7,505	44,035

IPART has noted MMA's lack of confidence about the input data used for the independent forecasts and the variations in results provided when incorporating different variables into the model. However, the difference between the forecasts made by Sydney Water and MMA are not considered to be significant given the limitations on the data available.

9.5 IPART's decision

IPART's decision for the draft determination with respect to the proposed consumption forecasts for the forthcoming price period are outlined in Table 9.5.

Table 9.5 IPART proposed consumption forecasts (ML pa)

	2008/09	2009/10	2010/11	2011/12	Total
Total metered residential treated water sales	327,010	358,996	355,144	352,907	1,394,057
Total metered non residential treated water sales	131,489	140,515	130,994	124,603	527,601
Total consumption (including losses)	519,371	560,039	544,082	534,465	2,157,957

10 Structure of prices

This chapter explains IPART's findings on the structure of prices for Sydney Water's water, wastewater, stormwater and recycled water services. The chapter is structured as follows:

- section 10.1 discusses the efficient prices of monopoly services
- section 10.2 discusses IPART's findings on the structure of water prices, including whether scarcity pricing is appropriate and whether an inclining block tariff (IBT) should be retained for residential customers
- section 10.3 discusses IPART's findings on the structure of sewerage prices
- section 10.4 discusses IPART's findings on the structure of stormwater prices
- section 10.5 discusses IPART's findings on the structure of recycled water prices for the Rouse Hill Development Area.

10.1 Efficient pricing of monopoly services

Economic theory suggests that an efficient price structure is one that encourages an efficient allocation of resources in the economy by the signals it sends to consumers and producers. This is achieved by setting prices at the marginal cost of supply, where 'marginal cost' is the increase in total costs resulting from the production of one more unit of output.[58]

The marginal cost of supplying water is largely dependent on the capacity of large, indivisible capital investments such as dams, desalination plants, treatment plants and transmission pipelines. Once a utility has incurred the cost of building the infrastructure, the marginal cost of supplying water is much lower than the average cost of supply.[59] This means that, if prices are set at marginal cost, the utility may not fully recover its costs. This will impact on the utility's incentive to invest in the business in the future.

[58] Marginal cost should also include any costs or benefits accruing to third parties (ie, those external to the transaction). These costs/benefits are known as externalities.

[59] Marginal cost can be low for long periods of time. However, as capacity is taken up, marginal cost increases as the next augmentation approaches (and may exceed average cost).

For this reason, it is generally accepted that pricing of monopoly services is efficient if it meets the following objectives:

- it signals to consumers the costs imposed (or avoided) if they increase (or reduce) their consumption by a small amount
- it allows utilities to recover the efficient cost of service provision and recover these costs with the least harm to economic efficiency.

A two-part tariff is generally considered the most efficient price structure for monopoly services as it comprises a single usage charge (set at the marginal cost of supply) and a fixed charge (to recover the remaining revenue requirement). A fixed charge is considered an efficient means of recovering the difference between average costs and marginal costs, because it is levied independently of usage and does not distort the pricing signal set by the usage charge.[60] Chapter 5 details how the revenue requirement is set.

10.2 Water price structure and water scarcity

In areas of the country where the demand for water has exceeded the available supply, governments have tended to implement water restrictions. Prices (in the form of an IBT) have commonly been used to complement water restrictions by encouraging consumers to curb their discretionary water consumption (eg, watering gardens and filling swimming pools). As an alternative to the use of water restrictions and IBTs, price may be used as the sole means of balancing supply and demand. This mechanism is known as scarcity pricing.

The use of restrictions alone or scarcity pricing to allocate the existing supply of water (by reducing demand) is likely to be the best option where the supply/demand imbalance is expected to be of a short term or intermittent nature. This is because restricting demand will generally be less costly than increasing supply. For instance, if supply is insufficient to meet demand for 1 out of every 50 years due to drought, investing in additional supply capacity to ensure that demand can be met at all times (including during droughts) will result in capacity that is surplus to requirements for 49 out of every 50 years, or 98 per cent of the time.

Of course, if the shortage is expected to be long term or persistent, for example, due to population growth, then signalling the cost of augmenting supply is likely to be more appropriate.[61]

IPART's findings in relation to the appropriateness of scarcity pricing and IBTs are discussed below.

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60 The theory supporting this assumes that people react to marginal price, rather than average price. See Nicholson W (1995) *Microeconomic Theory*, p 628.

61 In this instance, the most efficient price structure is to signal the higher costs of new supplies as represented by the long run marginal cost (LRMC) of supply. The LRMC represents the incremental cost of funding measures to bring supply and demand into balance over the longer term.

10.2.1 Scarcity pricing

Decision

14 IPART's decision for the draft determination is that scarcity pricing should not be implemented at this time.

Scarcity pricing has been advocated by a number of commentators as the best means of bringing demand for water into line with available supply.[62] Under such an approach, the price of water would increase during droughts when rainfall and water storage levels decrease. Conversely, lower prices would apply where water is in relative abundance, such as when water storages are near full.

In Sydney, the amount of water that can be drawn from the catchment dams in each year without needing to impose water restrictions too frequently or for too long, and without creating a risk that the system will approach emptiness during deep and prolonged drought, is known as the system yield. The system yield is currently calculated on the basis that water restrictions will only be in place for 3 per cent of the time.[63]

Prior to the imposition of restrictions in the current drought, annual demand exceeded the latest estimate of system yield. Therefore, even without the deep drought, Sydney had a supply/demand imbalance. Without alternative sources of water and/or water efficiency measures it would be necessary to have restrictions in place for substantial periods of time.[64]

Sydney Water raised concerns about the introduction of scarcity pricing. In particular, it notes that the demand for water is relatively inelastic, and so prices would need to rise significantly in times of scarcity. It is also concerned about the appropriateness of pricing an essential service in this manner, and the equity implications of such a step.[65]

One of the few submissions to support the use of scarcity pricing was that of Grafton, Kompas and Ward of the Crawford School of Economics and Government. They argued that scarcity pricing is economically efficient because water is allocated on the basis of the marginal willingness to pay, while mandatory water restrictions are inefficient because they prevent some high value uses of water from being realised.[66]

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62 See, for instance, Sibly, H (2006) "Urban Water Pricing", *Agenda*, volume 1, pp 17-30; Grafton, QR and Kompas, T (2007) "Pricing Sydney water" *The Australian Journal of Agricultural and Resource Economics*, Volume 51; and submission by Quentin Grafton, Tom Kompas and Michael Ward of the Crawford School of Economics and Government, Australian National University, 12 October 2007.

63 NSW Government, *2006 Metropolitan Water Plan*, April 2006, p 11; and Sydney Catchment Authority, *Review of Sydney's Water Supply System Yield*, December 2006.

64 IPART staff working paper, *Water scarcity: Does it exist and can price help solve the problem?* January 2008, pp 17-18, available from: www.ipart.nsw.gov.au.

65 Sydney Water submission, 14 September 2007, p 88.

66 Crawford School of Economics and Government (Australian National University) submission, 12 October 2007.

Grafton, Kompas and Ward's submission proposed a specific application of an IBT, incorporating an element of scarcity pricing, while protecting a basic level of consumption from high prices. Under their proposal, a low Tier 1 price is set (to cover the variable costs of production only), and this price is targeted at basic consumption.[67] The Tier 2 price is then set at the rate necessary to bring supply and demand into balance. This price would be adjusted each quarter in response to the amount of water in the catchment dams, so that the divergence between the Tier 1 and Tier 2 prices is greater when water levels are low and smaller when water levels are high.

Other submissions were generally unsupportive of a scarcity pricing regime. TEC did not support the use of scarcity pricing in all circumstances, noting that it was necessary to send a strong resource conservation signal at all times in order to maintain a drought reserve and delay the need for supply augmentations. However, TEC considered that increasing the price of water in periods of low supply may be appropriate if the desalination plant only operated as a drought relief measure.[68]

The Public Interest Advocacy Centre (PIAC) supported the use of water restrictions over scarcity pricing. It noted that scarcity pricing tends to favour those with higher levels of disposable income, potentially risking the health and wellbeing of low income customers.[69]

Alinta's submission did not support scarcity pricing, noting that water industry assets have long lives and water businesses require stability and predictability of income to recover the cost of their investments.[70]

IPART's analysis

A recently released IPART staff working paper[71] considered whether there was a continuing water scarcity issue in Sydney and if so, whether it would be best addressed by restrictions or whether scarcity pricing should be implemented to deliver the same results but with greater economic efficiency.

As discussed in that paper, there are pros and cons of both scarcity pricing and water restrictions. Scarcity pricing is considered more economically efficient because water is allocated to its highest value uses. However, water restrictions appear to have broad community acceptance and may be more effective at managing short term supply/demand imbalances. Furthermore, scarcity pricing would lead to significant prices rises in times of scarcity (see Appendix G for further information), which is likely to have adverse impacts on vulnerable customer groups.[72]

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67 The authors propose a basic consumption entitlement of 50 litres per person per day.
68 Total Environment Centre submission, 12 October 2007, p 3.
69 Public Interest Advocacy Centre submission, 19 October 2007, p 4.
70 Alinta submission, 12 October 2007, p 7.
71 IPART staff working paper, *Water scarcity: Does it exist and can price help solve the problem?* January 2008, available from: www.ipart.nsw.gov.au.
72 These and other issues are considered more extensively in: IPART staff working paper, *Water scarcity: Does it exist and can price help solve the problem?* January 2008, available from: www.ipart.nsw.gov.au.

The paper also found that water is not likely to be scarce over the medium term (ie, until at least 2028), given the construction of the desalination plant, increases in water recycling and investment in demand management measures.[73]

In addition to these developments, the significant rise in dam levels (currently at 66.5 per cent capacity)[74] also indicates that short term scarcity is not currently a problem. Nevertheless, it is important to reiterate that the amount of water that can be drawn from the catchment dams in each year (ie, the system yield) is calculated on the basis that water restrictions will still need to be imposed for around 3 per cent of the time.[75] Therefore, limited instances of short term scarcity are likely to emerge occasionally in the future when prolonged and severe drought conditions return.

IPART's decision for the draft determination is that scarcity pricing should not be implemented at this time given:

- a lack of water scarcity in the short or medium term
- doubts about the extent to which vulnerable customers would be adequately protected from very large price increases.

10.2.2 Inclining block tariffs (IBTs)

Decision

15 IPART's decision for the draft determination is to replace the two-tiered usage charge with a single usage charge. The usage charge will be set so that, by the end of the determination period, it will be equivalent to the estimated long run marginal cost (LRMC) of supply.

A key element of the water price structure in previous determinations for the metropolitan water agencies has been the use of both usage and fixed components. However, the structure of the usage component differs between customer groups. Individually metered residential customers are currently subject to an IBT with a two-tiered usage charge.[76] Non-residential customers and residential customers that share a water meter (eg, flats and units) pay a single usage charge for all units of water consumed.

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73 IPART staff working paper, *Water scarcity: Does it exist and can price help solve the problem?* January 2008, pp 18-19, available from: www.ipart.nsw.gov.au.

74 Sydney Catchment Authority, *Bulk Water Storage and Supply Report*, 6 March 2008.

75 NSW Government, *2006 Metropolitan Water Plan*, April 2006, p 11; and Sydney Catchment Authority, *Review of Sydney's Water Supply System Yield*, December 2006.

76 An IBT is a rate structure in which the usage charge of each succeeding block of usage is charged at a higher rate than the previous block(s). The usage charge is commonly accompanied by a fixed charge.

IPART introduced an IBT in the 2005 Determination. Its introduction stemmed from the findings of an earlier investigation into alternative price structures, which were assessed for their potential to reduce the demand for water in Sydney. IPART concluded that an IBT was likely to be the most suitable price structure for Sydney at that time, for the following reasons:[77]

- it had considerable potential to reduce demand, given the significant supply and demand imbalance
- it could be used to target discretionary water uses (eg, car washing and garden watering) by sending a strong conservation signal to heavy water users
- the step quantity could be set high enough to avoid capturing too much non-discretionary use
- it could minimise the exposure of vulnerable customers to higher prices.

IPART decided that non-residential customers would be exempt from paying the higher usage charge because the nature of their water use was likely to vary significantly, making it difficult to set an equitable step quantity. Residential customers that shared a water meter were also exempt, because these customers usually pay a pro-rata amount based on total consumption and the number of units in the block, meaning that the higher usage charge would be an ineffective signalling device.[78]

Sydney Water has proposed retaining an IBT for separately metered residential customers, but increasing the margin between the first- and second- tier prices to 50 per cent[79] to send a stronger price signal to high water users.[80] Under its proposal, non-residential customers and residential customers that share a water meter would continue to be subject to the Tier 1 usage price for all units of water consumed.

Other stakeholders appear to be generally supportive of the retention of an IBT to send a strong conservation signal to consumers. TEC supported an increase in the margin between the first- and second-tier prices,[81] while Alinta proposed that the two-tiered pricing structure be extended to include industrial users who have greater potential to reduce water use.[82]

However, support for an IBT was not universal. PIAC expressed scepticism about the ability of an IBT to reduce consumption, arguing that water restrictions were more effective than pricing at reducing consumption.[83] The Combined Pensioners

77 IPART, *Investigation into Price Structures to Reduce the Demand for Water in the Sydney Basin - Final Report*, July 2004, pp 14, 21 and 58.

78 IPART, *Investigation into Price Structures to Reduce the Demand for Water in the Sydney Basin - Final Report*, July 2004, p 10 and IPART, *Sydney Water Corporation, Prices of Water Supply, Wastewater and Stormwater Services from 1 October 2005 to 30 June 2009 - Final Report*, June 2005, p 136.

79 The Tier 2 price is currently 37 per cent higher than the Tier 1 price.

80 Sydney Water submission, 14 September 2007, p xi and pp 76-77.

81 Total Environment Centre submission, 12 October 2007, pp 2-3.

82 Alinta submission, 12 October 2007, pp 6-7.

83 Public Interest Advocacy Centre submission, 19 October 2007, pp 3-4.

and Superannuants Association also raised some concerns regarding the IBT. At the public hearing for this review it stated that:

> … we would argue that putting up the water usage charge, when it comes to economic and environmental benefits, is not as great as is sometimes made out. And it is important for our constituents because why would they be paying a higher price if it is not necessary?
>
> Within that context, what we have recommended is that if you have tier-two water usage charges for discretionary use basically you should also have a tier-two water service charge because if you use a lot of water you obviously put more pressure on the infrastructure and of course that would be a way of raising the revenue to fund that capital program.
>
> We also think that if you are going to use water usage charges as a price signal, it should be targeted solely at discretionary use, that is, at tier-two water usage charges.
>
> There also appears to be a misunderstanding across many of the individual submissions that the IBT would result in residents of units paying the higher Tier 2 usage charge.

IPART's analysis

IPART introduced an IBT at a time when Sydney was in the middle of a drought and dam levels were falling. At that time, reducing water use was a high priority. However, recent developments (see discussion in section 10.2.1 above) suggest that water is unlikely to be scarce over the short or medium term.

IPART considers that IBTs have both pros and cons. One benefit of setting a higher charge for discretionary water uses is that it is likely to produce a more significant demand reduction than setting a higher charge for non-discretionary uses. This is because demand for the former is likely to be more elastic[84] than demand for the latter.[85] Consequently, an IBT may be an effective tool for curbing usage when water is in short supply, because it can provide an equitable way to reflect the scarcity value of water. Another benefit is that it may be desirable from a social equity perspective if low income households pay a relatively low charge to meet basic water needs, while high income households pay a relatively high charge to meet discretionary needs.

However, since tiers are generally set on a per household basis rather than a per capita basis, the relatively high and low prices are unlikely to accurately target discretionary and non-discretionary uses, respectively. This could result in larger households incurring a higher charge to meet their basic water needs, with smaller households paying a lower charge to meet their discretionary needs. It could also result in socially inequitable outcomes because large, low income households will not

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84 The price elasticity of demand measures the percentage change in quantity demanded for a given percentage change in price. Where a small change in price results in a large change in the quantity demanded, demand is said to be elastic. Where a small change in price has little or no impact on the quantity demanded, demand is said to be inelastic.

85 However, discretionary water use is also targeted by water restrictions. Therefore, an IBT is likely to have less impact on discretionary water use than if it was applied in isolation.

be protected from high prices, while small, high income households will. In the 2005 Determination, in order to protect large households from incurring the higher usage charge to meet their basic water needs, IPART set the consumption level at which the higher usage charge starts applying at 400kL per annum.[86] In addition, low income households with six or more occupants who met certain criteria were made eligible for a rebate of up to $40 per annum if they consume more than 400kL per annum (the threshold at which the higher usage charge starts applying).

Another problem with IBTs is that they may result in some customers changing their consumption behaviour in response to the higher tier price, even if they are low water users. This is supported by the findings of IPART's 2007 Household Survey.[87] Consequently, if the Tier 2 price is set too high, it may have the unintended consequence of causing some customers (particularly vulnerable customers) to restrict their basic usage beyond what is necessary to avoid paying the higher price.

An IBT is also less efficient than a single usage charge (set at the marginal cost of supply) because it results in at least some consumption being priced at a level either above or below marginal cost. Setting usage charges at the marginal cost of supply represents the sacrifice that society makes in producing this product over others. This is also known as the opportunity cost. It signals to consumers the costs imposed (or avoided) if they increase (or reduce) their consumption by a small amount.

IPART's decision

IPART's decision for the draft determination is to replace the two-tiered usage charge with a single usage charge.

In order to balance the demand and supply of water over the longer term, economic theory suggests that water prices should be set at the long run marginal cost of supply (LRMC). The LRMC represents the incremental cost of delivering new measures to bring the demand and supply of water into balance over the longer term. Setting prices at too low a level encourages the over consumption of water and the valuing of water at less than its cost while setting the price of water above the cost of producing it at the margin will result in consumers unnecessarily restraining consumption. It can also foster inefficient entry into the water supply market.

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86 This was supported by a finding of IPART's 2003 Household Survey, which found that "pre-restriction average annual consumption for households of 5 or more people was 398kL per annum – and with recent efforts in demand management, this average consumption may well have fallen." See IPART, Sydney Water Corporation, *Prices of Water Supply, Wastewater and Stormwater Services from 1 October 2005 to 30 June 2009 – Final Report*, June 2005, p 139.

87 Of those respondents that were aware of the IBT, 19 per cent of low water using households (consuming less than 100 kilolitres per year) and 33 per cent of moderate water using households (consuming between 100 and 300 kilolitres per year) stated that their water consumption had changed due to the introduction of the IBT. See IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra, Results from the 2006 household survey*, November 2007, pp 45-46.

Despite support for the retention of an IBT in submissions, IPART considers that an IBT is no longer warranted given the current lack of water scarcity in Sydney. It considers that a single usage charge set at the LRMC of supply is more appropriate, because it provides efficient price signals to consumers about the long term cost consequences of their consumption.

Therefore, the usage charge will be set such that, by the end of the determination period, it will be equivalent to the long run marginal cost (LRMC) of supply. IPART's estimate of the LRMC is consistent with the current Tier 2 usage charge. See section 11.2 and Appendix J for further information on the calculation of the LRMC.

The fixed charge will continue to act as a balancing item to enable Sydney Water to recover the remainder of its efficiently incurred costs. A fixed charge is considered to be an efficient means of recovering the difference between average costs and marginal costs, because it is levied independently of water usage and does not distort the pricing signal set by the usage charge.[88]

10.3 Sewerage price structure

Decision

16 IPART's decision for the draft determination is to maintain the current structure of prices for sewerage services for residential and non-residential customers.

The price structure for sewerage services differs for residential and non-residential customers. Residential customers only pay a fixed service charge. Non-residential customers pay a fixed service charge which includes the cost of discharges up to 500kL per year, and a usage charge for discharges over 500kL.

Sydney Water proposes that residential properties continue to pay a fixed service charge only. However, it sought to augment the usage charge in the sewerage charging system that applies to non-residential properties. Sydney Water asserted that:[89]

> The recent arbitration by the Australian Competition and Consumer Commission (ACCC) for access to its sewage networks has highlighted the need to review the threshold for the sewerage usage charge for non-residential properties… In particular, for non-residential properties with sewage discharges of close to 500kL a year, allocated sewage treatment and disposal costs on some networks can exceed the fixed charge per property.

To address this issue, Sydney Water proposes a lowering of the sewerage usage charge threshold from 500kL per year to 400kL from 1 July 2008 and to 300kL from 1 July 2011.

88 The theory supporting this assumes that people react to marginal price, rather than average price.
89 Sydney Water submission, 14 September 2007, p 78.

At the public hearing, Sydney Water contended that the non-residential sector accounts for 26 per cent of the sewerage discharged, but contributes less than 20 per cent of the revenue. It claimed that its proposal would:[90]

> …better align costs, access charges and the revenues obtained from individual non-residential properties over the course of the determination.

Many of the individual submissions objected to the application of a fixed sewerage charge for residential customers, citing its inequity to low water users. Stakeholders did not indicate whether they supported Sydney Water's proposal to lower the sewerage usage charge threshold for non-residential customers.

10.3.1 IPART's analysis

IPART considers that the connection that Sydney Water has attempted to draw between the amount of sewerage discharged and cost is not compelling, and that little evidence has been provided to justify its proposal that the usage charge threshold should be lowered for non-residential customers. There is no direct, linear relationship between the amount of sewerage discharged and the amount of revenue that a particular customer should pay. For instance, a study undertaken by Sydney Water in the late 1980s into the cost of sewerage services found that while the non-residential sector contributed (at that time) 42 per cent of sewerage flows, it was responsible for only 27 per cent of the cost.[91]

The difference between discharges and cost attribution relates to the fact that a sewerage service is made up of a number of different cost elements encompassing such things as reticulation and transportation, sewerage treatment, residuals management and retail and corporate functions. While the primary driver of some of these functions may be related to dry weather flows, some costs are likely to relate to customer numbers (or equivalent residential properties) and wet weather flows. Others are likely to relate to pollutant loads in the waste stream.

IPART set the threshold at 500kL so as to leave only the larger dischargers liable to pay usage charges. This is intended to reflect the costs associated with the collection, transportation and treatment of large volumes of sewerage.

Setting the threshold at this level also brings other benefits in the form of lower management and administrative costs for the overall sewerage charging system. It recognises that the level of usage and the demand placed on Sydney Water's systems by small non-residential customers is really no different to a residential property. The system effectively treats small businesses and residential properties in a similar fashion and reflects IPART's decision to exclude the residential sector from paying a sewerage usage charge.

90 Sydney Water submission, 14 September 2007, p 78.
91 Report on water and sewerage services and pricing implications, August 1988, p 6.

IPART is not convinced that the ACCC's report highlights the need to review the threshold for the sewerage usage charge for non-residential properties. The ACCC is of the view that provided access prices properly reflect avoidable costs, a retail-minus approach will provide the correct incentives for efficient entry.

The ACCC further contends that the crucial element in arriving at an access charge is ensuring that Sydney Water's avoidable costs are robust. IPART's view is that it also needs to satisfy itself that any prices being proposed reasonably reflect the costs of service provision. Sydney Water has not previously supplied any information that would enable IPART to form a view on these matters.

IPART does not accept Sydney Water's proposal to lower the sewerage usage charge threshold for non-residential customers. IPART considers that Sydney Water has so far not provided sufficient evidence to substantiate its proposal to lower the threshold on the basis of better cost reflectivity. As a result, in this draft determination, IPART has adjusted downwards the revenue from sewerage charges by $15.4 million because of the insufficient evidence to support Sydney Water's proposal. IPART will reconsider this issue if Sydney Water provides further evidence to substantiate its proposal.

IPART continues to be of the view that a fixed charge is appropriate for residential customers. It has previously noted that households have limited opportunities to respond to usage charges and that discharges are difficult to measure.

IPART's decision for the draft determination is to maintain the current structure of prices for sewerage services for residential and non-residential customers.

10.4 Stormwater price structure

Decision

17 IPART's decision for the draft determination is to maintain the current price structure for stormwater services.

Stormwater management in Sydney is shared among a number of agencies, including local councils and Sydney Water. Sydney Water provides stormwater services to more than 474,000 properties (or 25 per cent of metropolitan Sydney) mostly in the inner-west and inner south-west suburbs.[92]

Only properties in a Sydney Water stormwater catchment area pay a stormwater charge to Sydney Water. Residential and non-residential properties within this area pay a fixed service charge. The quarterly charges are currently $10.95 for residential properties and $28.50 for non-residential properties.[93]

92 See Sydney Water's website.

93 Sydney Water, *Service Charges 2007-2008, effective from 1 July 2007*, available from: www.sydneywater.com.au.

Sydney Water has proposed maintaining the current structure of charges for stormwater services.[94] In the 2005 Determination, IPART recommended that Sydney Water develop its proposal for charges based on property size for consideration at the next price review, then scheduled for 2009.[95]

Sydney Water contends that the time constraints associated with this earlier than forecast review has prevented it from developing this proposal and suggested that this be delayed until the next price review. IPART has accepted Sydney Water's suggestion.

10.4.1 IPART's findings

In the absence of any information to suggest that the structure of prices be changed at this time, IPART's decision for the draft determination is to maintain the current price structure for stormwater services.

10.5 Recycled water price structure

In September 2006, IPART completed a review of pricing arrangements for recycled water and sewer mining by the four metropolitan retail water agencies in NSW.[96]

In this review IPART made a determination on recycled water periodic charges (and developer charges) for the Rouse Hill Development Area. It did not make determinations for other recycled water schemes, but developed a pricing framework that divides recycled water projects into two groups:

- mandated schemes
- voluntary schemes.

This distinction reflects the degree of choice that customers have when connecting to recycled water schemes, which influences the relative market power of recycled water suppliers and customers.

A mandated scheme requires customers to connect due to government policy. IPART decided that it would only determine a price for mandated schemes where there was sufficient information for it to set efficient prices. Rouse Hill was the only scheme to meet this criterion. For mandated schemes where there was insufficient information to set prices, IPART established pricing guidelines to assist water agencies in calculating prices. These guidelines require prices to be structured to

94 Sydney Water submission, 14 September 2007, p 79.

95 Hunter Water's stormwater charges are linked to property size (as a proxy for stormwater runoff). In implementing the new pricing structure, IPART noted that it would result in more equitable and cost-reflective prices that are consistent with COAG's pricing principles. See IPART, *Sydney Water Corporation, Prices of Water Supply, Wastewater and Stormwater Services - Final Report*, pp 126-127.

96 Sydney Water, Hunter Water, Gosford City Council and Wyong Shire Council. See IPART, *Pricing arrangements for recycled water and sewer mining: Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council - Final Report*, September 2006.

include a usage charge set at a level that sends appropriate consumption signals aimed at equating the demand for recycled water with the available supply.[97] Prices may also include a fixed charge.

A voluntary scheme does not require customers to connect. Customers of voluntary schemes have a substitute water product available to them (usually at a regulated price) such as potable water or river water. IPART decided not to determine prices for these customers, allowing prices to be determined by direct negotiation between the parties.[98]

10.5.1 Prices for Rouse Hill Development Area

Decision

18 IPART's decision for the draft determination is to maintain the current structure of prices for recycled water services and the current structure of the River Management Charge for the Rouse Hill Development Area.

Sydney Water currently provides 1.8 GL a year of recycled water to over 17,000 customers in the Rouse Hill Development Area.[99] The recycled water charge includes a fixed access charge and a usage charge. The drainage charge (now termed the River Management Charge) is a fixed charge for residential customers and a charge based on property size for non-residential customers.

As discussed above in section 4.5, IPART developed a pricing framework for recycled water pricing in 2006. IPART also decided that prices in Rouse Hill should be revised so that they were consistent with this framework.[100] Applying the framework, IPART set maximum charges for recycled water charges at Rouse Hill that resulted in a usage charge that increased so that is equal to 80 per cent of the potable water usage charge by 2008/09. The fixed charge was decreased over the determination period to offset the increase in the usage charge.[101]

Sydney Water did not submit a proposal in relation to the structure of recycled water prices or the River Management Charge for Rouse Hill. In the absence of any information to suggest that the structure of prices should be changed, IPART's decision for the draft determination is to maintain the current structure of prices for recycled water services and the current structure of the River Management Charge.[102]

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97 The guidelines also require the usage price for recycled water to link to the potable water price where demand for recycled water is expected to exceed supply by more than 10 per cent.

98 IPART suggested some high level principles to help guide the negotiations.

99 Sydney Water submission, 14 September 2007, Appendix H.

100 IPART decided that it will only make a determination for mandated recycled water schemes where there is sufficient information for it to set efficient prices. It considered that the Rouse Hill scheme is a mandated scheme and there is sufficient information about this scheme for it to set efficient prices.

101 IPART considered that the usage component should increase relative to the fixed charge, to encourage more efficient use of recycled water and better equate demand with supply, and hence reduce the need for potable water top-ups.

102 IPART's decision in relation to the level of charges to apply for the Rouse Hill Development Area is discussed in section 11.8.1.

11 Pricing decisions for individual services

This chapter outlines IPART's decisions for the draft determination on the maximum prices to be charged for water, sewerage and stormwater services over the determination period. The chapter is structured as follows:

- section 11.1 provides a summary of IPART's pricing decisions
- section 11.2 discusses filtered (potable) water charges for metered properties
- section 11.3 discusses other water charges
- section 11.4 discusses sewerage charges for properties connected to the sewerage system
- section 11.5 discusses other sewerage charges
- section 11.6 discusses stormwater charges
- section 11.7 discusses trade waste charges
- section 11.8 discusses charges for the Rouse Hill Development Area
- section 11.9 discusses miscellaneous charges
- section 11.10 discusses minor service extension charges
- section 11.11 discusses issues regarding the levying of charges on multi-dwelling properties.

11.1 Summary of pricing decisions

IPART has made the following pricing decisions for **water services**:

- set the usage charge at the LRMC of supply - estimated as $1.83 per kL (real 2007/08) - by the end of the determination period[103]
- phase out the two-tiered IBT for the water usage charge[104] and introduce a single usage charge for all units of consumption

[103] References to real price movements indicate that these price movements do not include movements in CPI.

[104] Currently applicable to individually metered residential customers.

- increase the water service charge for residential customers by 80 per cent (in real terms) so that it is $101.38 per property (real, 2007/08) in 2011/12 and increase the water usage charge by 37 per cent so that it is $1.83 per kL (real, 2007/08) in 2011/12[105]
- reject Sydney Water's proposal to set the fixed charge for residential properties based on meter size
- set the unfiltered water usage charge so that it is $0.30 lower than the Tier 1 usage charge for filtered water, and set the unfiltered water service charge so that it is equivalent to the fixed service charge for filtered water
- maintain the current approach to setting charges for water supply services to metered standpipes
- maintain the current approach to setting charges for unmetered residential and non-residential customers, but assume a usage level of 200kL per annum for unmetered residential properties
- set a charge of zero for properties that are not connected to the water supply system.

IPART has made the following pricing decisions for **sewerage services**:

- Maintain the current structure of sewerage charges for properties connected to the sewerage system, and increase the sewerage service charge for residential customers by 15 per cent (real) over the determination period. Maintain the usage charge (applicable only to non-residential customers that discharge over 500kL per year) in real terms.
- Set a charge of zero for properties that are not connected to the sewerage system.
- Maintain the current price for sewerage services to exempt land (in real terms) over the determination period.
- For Blue Mountains septic pump out services, continue to require customers who have access to Sydney Water's sewerage system to directly contract with private pump out providers. For those customers that do not have access to Sydney Water's sewerage system, maintain the current price (in real terms) over the determination period.
- Reject Sydney Water's proposal to establish a separate pricing arrangement for strata developments with onsite sewage treatment facilities and a standby connection to Sydney Water's sewerage system.

IPART has made the following pricing decisions for **stormwater services**:

- maintain the current stormwater charge in real terms over the determination period.

[105] 2007/08 to 2011/12.

IPART has made the following pricing decisions for **trade waste services**:

- accept Sydney Water's proposal to maintain the current trade waste charges (in real terms) over the determination period.

IPART has made the following pricing decisions for the **Rouse Hill Development Area**:

- set the recycled water usage charge so that it is 80 per cent of the potable water usage charge and to maintain the existing recycled water fixed charge (in real terms) over the determination period
- maintain the current River Management Charge (in real terms) over the determination period.

IPART has made the following pricing decisions for **miscellaneous services**:

- accept Sydney Water's proposal to maintain existing miscellaneous charges (in real terms) over the determination period
- reject Sydney Water's proposal to introduce a late payment fee
- reject Sydney Water's proposal to introduce a credit card fee
- accept Sydney Water's proposal to remove price control on charges for pier supervision application and concrete encasement supervision application.

IPART has made the following pricing decisions for **minor service extension charges**:

- Set charges based on the methodology set out in the 2005 Determination, with charges to be adjusted annually for CPI.

11.2 Filtered (potable) water charges for metered properties

Decision

19 IPART's decision for the draft determination is that Sydney Water can charge customers the maximum water charges in Table 11.1. The usage charges reflect IPART's decision to phase out the two-tiered inclining block tariff (IBT) and to set a single usage charge for all customers at the long run marginal cost (LRMC) of supply by the end of the determination period.

Table 11.1 IPART's decision for the draft determination on water charges ($real, 2007/08)

	Current (1 July 2007 to 30 June 2008)	1 July 2008 to 30 June 2009	1 July 2009 to 30 June 2010	1 July 2010 to 30 June 2011	1 July 2011 to 30 June 2012
Service charge ($ per annum) [a]	56.17	64.82	77.38	88.35	101.38
Tier 1 usage charge ($ per kL)	1.34	1.54	1.72	1.82	1.83
Tier 2 usage charge greater than 1.1kL per day ($ per kL) [b]	1.83	1.77	na [c]	na	na

a This charge applies to residential properties. For non-residential properties with larger connections, the charge is calculated according to the meter size.

b The Tier 2 usage charge applies only to individually metered residential properties. It should be noted that given the seasonality of water consumption, some customers who consume less than 400kL over the year, or approximately 1.1kL/day, may exceed the daily limit in any given quarter and thus be subject to the Tier 2 charge. The Tier 2 usage charge will remain constant at $1.83 (in nominal dollars) until it is removed.

c The Tier 2 usage charge will continue to apply until the Tier 1 usage charge (in nominal dollars) is higher than $1.83 (in nominal dollars). Whether this occurs in 2009/10 or 2010/11 will depend on the level of CPI increases.

While customers receiving water services from Sydney Water are currently subject to a fixed service charge and a usage charge, the charges vary between residential and non-residential properties as follows:

- Residential houses currently pay a fixed service charge and a two-tiered usage component, with a lower usage charge for the first 400kL of water consumed per annum and a higher charge for each additional unit.
- Non-residential properties pay a service charge based on the size of the water meter(s) connected to the property. A single usage charge is levied on all units of consumption. There is no IBT for non-residential properties.

As discussed in chapter 10, IPART has decided to remove the two-tiered IBT (that applies to residential houses) over the determination period and to replace it with a single usage charge set at the LRMC of supply by the end of the determination period.[106]

IPART has previously stated its preference for setting water prices with reference to marginal cost on a number of occasions. While information shortcomings and the need to forecast costs and water demands into the future mean that marginal costs cannot be estimated with certainty, approximate estimates of marginal cost can be made.

At IPART's 2005 pricing review, the Government's Metropolitan Water Plan provided a basis for estimating marginal costs. A range of marginal cost estimates were derived based on different combinations of works and activities that were planned to bring the demand and supply of water in Sydney into balance. The work undertaken at the time suggested that the LRMC of water in Sydney was in the range of $1.20 to $1.50 per kilolitre ($2004/05) depending on the combination of supply side and demand management initiatives likely to be put in place. At the time, these estimates were higher than the then prevailing water price.

For this determination, IPART has estimated the LRMC to be $1.83 (real, 2007/08).[107] Appendix J provides an explanation of the calculation of this figure. The estimate of the LRMC is consistent with the current level of the Tier 2 usage charge and results in a 37 per cent increase (in real terms) on the current Tier 1 usage charge.

The fixed charge acts as a balancing item to enable Sydney Water to recover the remainder of its efficiently incurred costs and will increase by 80 per cent (in real terms). The increase in the fixed charge is partly as a result of the desalination plant. It thus also acts as an insurance policy against future water shortages arising from droughts because the desalination plant it is likely to have surplus capacity over the medium term and could increase water supplies when dam levels are low.

11.2.1 Residential properties – specific issues

Sydney Water's proposal to encourage the use of 20mm meters

The water service charge for commercial, industrial and multiple dwelling buildings (eg, units, flats and townhouses) is based on the size of the water meter serving the property. However, houses are charged the water service charge for a standard 20mm meter, regardless of the actual size of the meter.

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106 The Tier 2 usage charge will be removed by progressively raising the Tier 1 price to the point where it is equal to the Tier 2 price (which is held constant until the two prices are the same). At this point, there will be a single price for all units of water. Whether this occurs in 2009/10 or 2010/11 will depend on the level of CPI increases.

107 This calculation was based on achieving a price equivalent to the marginal cost of $1.90 per kL by 2015, the point at which a further stage of the desalination plant may be considered.

The majority of houses have 20mm meters connected to their properties. However, Sydney Water estimates that there are around 22,000 houses (approximately 2.1 per cent of houses) with meters greater than the standard 20mm size. Sydney Water proposes to encourage all residential properties to use standard 20mm meters. It argues that larger meters are less accurate for small volumes of water and are, therefore, less suitable for residential properties. It also claims that larger meters increase system complexity and require additional staff training, resulting in high costs. Sydney Water argues that larger meters should only be used at properties where a high instantaneous flow rate is required (eg, where there are large outdoor areas using automatic watering).

In order to encourage all residential properties to use a standard 20mm meter, Sydney Water proposes:

- charging residential properties a service charge based on their actual meter size
- encouraging the connection to a 20mm meter by meeting some of the costs of replacing the customer's old meter (including the replacement of couplings, reducers and some plumbing labour costs)
- introducing the charge based on meter size in the second year of the determination period to provide time to communicate with affected customers about the opportunity to obtain a smaller meter.

IPART considered this issue as part of the 2005 Determination and did not support Sydney Water's proposal at that stage. IPART noted that its decisions on the structure of water prices in the 2005 Determination had placed more emphasis on water usage charges and that customers who used more water as a result of a larger meter would be charged more through the increased usage charges. Accordingly, IPART did not consider it appropriate to further increase the fixed charge for these customers.

IPART does not consider that Sydney Water has provided any new evidence that would justify IPART changing its decision. Furthermore, given the increases in prices for this draft determination, IPART considers that a detailed impact analysis would be required before considering this issue further. Therefore, IPART does not accept Sydney Water's proposal to set the fixed charge for residential properties based on meter size at this time.

However, this does not prevent Sydney Water from undertaking the meter exchanges itself, at its own cost, given that the larger meters for residential properties were issued by Sydney Water just prior to their original installation.

11.3 Other water charges

11.3.1 Charges for unfiltered water

Decision

20 IPART's decision for the draft determination is to set the unfiltered water usage charge so that it is $0.30 lower than the Tier 1 usage charge for filtered (potable) water and to set the unfiltered water fixed charge so that it is equivalent to the fixed service charge for filtered (potable) water.

Unfiltered water is water that has been chemically treated, but not treated at a water filtration plant. Sydney Water currently sells unfiltered water to a range of customers including large industrial customers such as BlueScope Steel in Wollongong.

There is a cost difference between unfiltered and filtered water, primarily in the cost of treating the water. There are also limited 'avoided costs' of unfiltered water. For example, unfiltered water does not postpone investment in any form of water augmentation because it is dam water that would otherwise be treated and sold as potable water. There may be, however, be a very small amount of avoided costs of deferred investment in new treatment plants.

As noted previously, establishing prices that reflect the cost of providing the service is a key principle adopted by IPART to set the prices for the regulated services provided by Sydney Water. IPART undertook preliminary analysis of the cost differential associated with the production of unfiltered water (as opposed to filtered water) and considers that these costs are likely to be no more than $0.30 per kL.

IPART considers that this cost differential should be reflected in the usage component of the charge because the cost differential directly relates to the volume of water that would otherwise be treated and sold as filtered water. Therefore, IPART has decided to set the unfiltered water usage charge so that it is $0.30 lower than the Tier 1 usage charge for filtered water. IPART intends to undertake further analysis of the level of the avoided costs before releasing its final report.

11.3.2 Charges for water supply services to metered standpipes

Decision

21 IPART's decision for the draft determination is to maintain the current approach for setting charges for water supply services to metered standpipes.

Metered standpipes are used to obtain water directly from hydrants for approved activities such as construction, concrete sawing, dust suppression and water carting. Sydney Water does not allow standpipes to be used for agricultural, private or domestic use or to supply water to premises as an alternative to its normal water service.

Sydney Water has indicated that the majority of standpipes are used by water carters who provide water to rural properties on the outskirts of Sydney. Under this arrangement, carters purchase metered standpipes from accredited providers and connect these to designated hydrants. The carters fill water directly from these standpipes and transport the water to properties not connected to Sydney Water's water system.

IPART is required to set a fee for the service of delivering water to the standpipe. Currently a fixed water service charge equivalent to that paid by metered properties for filtered water (corresponding to the applicable meter size) applies. Usage charges also apply. For filtered water, the usage charge is equivalent to the filtered water Tier 1 usage charge that currently applies to metered properties. For unfiltered water, the usage charge is equivalent to the unfiltered water charge that currently applies to metered properties.

Sydney Water has not proposed any changes to this approach and no other stakeholders have submitted comments on this charge. In the absence of information suggesting that the current approach for setting these charges should change, IPART has decided that it should be maintained.

11.3.3 Charges for water supply services to unmetered properties

Decision

22 IPART's decision for the draft determination is to maintain the current approach tosetting charges for unmetered residential and non-residential customers, but to assume a usage level of 200kL per annum for unmetered residential properties.

Sydney Water provides water to a small number of unmetered residential and non-residential properties. Under the current approach, these properties are required to pay a fixed charge per annum based on the sum of the following:

- a fixed water service charge equivalent to the fixed charge applicable to metered properties for filtered water with a 20mm meter.
- a usage charge equivalent to the Tier 1 usage charge applicable to metered properties for filtered water, where unmetered residential properties are assumed to use 250kL per annum and unmetered non-residential properties are assumed to use 120kL of water per annum.

Sydney Water has not proposed any changes to this approach and no other stakeholders have submitted comments on this charge.

IPART has recently received the results of its 2006/07 Household Survey for the Sydney area which indicates that average consumption for a residential property is 200kL per annum. Sydney Water has also indicated to IPART that 200kL is likely to be a more accurate measure of the consumption of unmetered residential properties. However, it also notes that it is gradually rolling-out a program to meter these properties and that maintaining the 250kL assumed usage level will provide a greater incentive for these properties to choose to have a meter installed.

IPART notes that, using current prices, the 200kL assumed usage would result in a bill reduction of approximately $70 per annum for unmetered residential properties. IPART does not consider that this difference is sufficiently large to create a disincentive to install meters.

IPART has decided to maintain the current approach to charging for unmetered residential and non-residential customers, but to assume a usage level of 200kL per annum for unmetered residential properties.

11.3.4 Properties not connected to the water supply system

Decision

23 IPART's decision for the draft determination is to set a charge of zero for properties that are not connected to the water supply system.

Currently the charge for properties not connected to the water supply system is zero. Sydney Water has not proposed any changes to this approach and other stakeholders have not submitted comments on this charge. Therefore, IPART has decided to set a charge of zero for properties not connected to the water supply system, consistent with the approach adopted at the 2005 Determination.

11.4 Sewerage charges for properties connected to the sewerage system

Decision

24 IPART's decision for the draft determination is that Sydney Water can charge customers the maximum sewerage charges in Table 11.2.

Table 11.2 IPART's decision for the draft determination on sewerage charges ($real, 2007/08)

	Current (1 July 2007 to 30 June 2008)	1 July 2008 to 30 June 2009	1 July 2009 to 30 June 2010	1 July 2010 to 30 June 2011	1 July 2011 to 30 June 2012
Service charge ($ per annum) [a]	407.81	454.15	455.66	461.15	467.21
Usage charge: non-residential properties ($ per kL) [b]	1.30	1.30	1.30	1.30	1.30

a This charge applies to residential properties. For non-residential properties with larger connections, the charge is calculated according to the meter size and discharge factor.

b The usage charge applies only to non-residential properties that discharge more than 1.37kL per day multiplied by the number of days in the meter reading period. This equates to 500kL per year.

Residential houses only pay a fixed service charge for sewerage services. Non-residential properties pay a fixed service charge based on the size of the water meter and the relevant discharge factor. Non-residential properties also pay a usage charge for each kL of sewerage discharged in excess of 500kL per year. As discussed in chapter 10.3, IPART has decided to reject Sydney Water's proposal to lower the usage charge threshold for non-residential properties and to maintain the current structure of charges for sewerage services.

Sydney Water also proposes a progressive increase of the usage charge (in real terms) from the current price of $1.30 to $1.67 (real, 2007/08). However, IPART considers that Sydney Water has not provided sufficient information and justification to substantiate these proposed increases. In the absence of further information, IPART has decided to maintain the existing usage charge (in real terms) over the determination period.

11.5 Other sewerage charges

11.5.1 Properties not connected to the sewerage system

Decision

25 IPART's decision for the draft determination is to set a charge of zero for sewerage services for properties that are not connected to the sewerage system.

At the 2005 Determination, the charge for sewerage services (other than the Blue Mountains septic pump out services) for a property not connected to the sewerage system was set at zero. Sydney Water has not proposed any changes to this approach and other stakeholders have not submitted comments on this charge. Therefore, IPART has decided to set a charge of zero for sewerage services for properties not connected to the sewerage system, consistent with the approach adopted at the 2005 Determination.

11.5.2 Exempt land connected to the sewerage system

Decision

26 IPART's decision for the draft determination is to maintain the current price for sewerage services to exempt land (in real terms) over the determination period.

Exempt properties currently benefit from a discount for water and sewerage services.[108] In the 2005 price review, Sydney Water noted that it was proposing to modify the charging arrangement for exempt properties, which required amendments to legislation.

Currently IPART sets a fixed charge per water closet or urinal closet for exempt properties. In its submission, Sydney Water has not proposed a charge for these services and other stakeholders have not submitted comments on this charge. Therefore, IPART has decided to maintain the current price (in real terms) over the determination period.

11.5.3 Blue Mountains septic pump out services

Decision

27 IPART's decision for the draft determination is to continue to require customers who have access to Sydney Water's sewerage system to directly contract with private pump out providers. For those customers that do not have access to Sydney Water's sewerage system, IPART's decision is to maintain the current price (in real terms) over the determination period.

Sydney Water currently provides septic pump out services for approximately 680 customers in the Blue Mountains. Sydney Water has indicated that approximately 10 of these customers have access to a reticulated sewage service but have not connected to it.

At the 2005 Determination, IPART set a charge for pump out service. For those customers that do not have access to a reticulated system, IPART set a two part tariff with a fixed charge and a charge per kL of sewage pumped. It also decided that those customers that have access to the reticulated system should directly contract

[108] This exemption is granted through legislation.

with private pump out service providers. However, IPART required Sydney Water to provide these customers with two years notice of this new requirement. The two year notice period has now expired.

For this draft determination, Sydney Water has not proposed a fee for septic pump out charges and other stakeholders have not submitted comments on this charge. IPART's decision for the draft determination is to continue to require customers who have access to Sydney Water's sewerage system to directly contract with private pump out providers. For those customers that do not have access to Sydney Water's sewerage system, IPART's decision for the draft determination is to maintain the current price (in real terms) over the determination period.

11.5.4 Sewerage charges for decentralised systems

Decision

28 IPART's decision for the draft determination is to reject Sydney Water's proposal to establish a separate pricing arrangement for strata developments with onsite sewage treatment facilities and a standby connection to Sydney Water's sewerage system.

In its submission, Sydney Water notes that there are a number of strata developments that have gained approval from local councils to build, own and operate small decentralised sewage treatment systems onsite. These systems have a holding tank and pump treated waste onto adjacent playing fields or vacant land. As a result, the development does not rely on Sydney Water's sewage transport system or treatment plant. However, the development still requires a connection to Sydney Water's sewerage system for emergency events, for example, where the onsite treatment plant fails.

Sydney Water notes that the size of the connection point is smaller than a normal connection. Sydney Water proposes that these developments should pay a lower sewerage service charge to reflect the fact that these are 'standby connections'. Sydney Water proposes that these customers be charged a lower price based on the meter or number of meters that supply the development multiplied by the discharge factor. Sydney Water argues that this would be more cost reflective and would not deter these sorts of developments which encourage the reuse of effluent.

IPART notes Sydney Water's concern to ensure that, where possible, the fixed service charge should not deter customers from developing facilities to reuse effluent. At this stage, there appears to be only a small number of customers that are likely to be covered by Sydney Water's proposal. These types of development, however, may be more prominent in the future following the implementation of the *Water Industry Competition Act 2006*.

IPART does not support Sydney Water's proposal to set prices for specific customer types. IPART considers that the existing charging arrangements are sufficiently flexible to allow Sydney Water to choose (with the Treasurer's concurrence) to apply

a lower charge for specific customer groups than those set in the determination. For instance, Sydney Water has already adopted this approach in relation to strata lots with individual storage units.

11.6 Stormwater charges

Decision

29 IPART's decision for the draft determination is to reject Sydney Water's proposal and maintain the current stormwater charge (in real terms) over the determination period.

As discussed in Chapter 10, IPART has decided to maintain the current structure of charges for stormwater services. Sydney Water proposes real increases in stormwater prices of 0.2 per cent in 2008/09 and 1 per cent in each year up to 2011/12.

Sydney Water has provided no evidence to support this proposal. The charges established by IPART in the 2005 Determination were set to be cost reflective by the last year of that determination period (ie, 2008/09).

IPART considers that there has not been sufficient change to Sydney Water's proposed stormwater expenditure (compared to IPART's last review) to warrant the price increases proposed in its submission. Given this, IPART has decided to maintain the current charge in real terms over the determination period.

11.7 Trade waste charges

Trade wastewater typically involves much higher strength wastewater than domestic sewage, and consequently can impact on downstream sewerage systems and sewage treatment plant (STP) operation. In addition, the presence of toxic substances can potentially adversely affect the biological processes within the STP, damage sewerage infrastructure and present a significant safety risk for sewerage system operations and maintenance personnel.

While Sydney Water has a general policy for managing trade wastewater, it tends to develop trade waste licence agreements with its customers based on the type of contaminants generated by the customer as well as its ability to approach domestic sewage quality. These customers are allowed to release trade wastewater into the sewerage system in accordance with the trade waste agreement.

The maximum fees set by IPART associated with trade waste discharges to the sewer relate to the cost of:

- transporting the wastewater (through the sewerage reticulation system)
- treating the wastewater (through the sewage treatment plant)
- maintaining the transportation and treatment infrastructure

- minimising public/environmental nuisance from acceptance of wastewater (such as preventing overflows and reducing odours)
- implementing risk and hazard identification incorporating programs to minimise damage to systems and maintain a safe working environment for operations/maintenance personnel
- implementing wastewater monitoring programs to ensure that licence agreements are met.

11.7.1 2003 and 2005 Determinations

As part of IPART's 2003 price review, the water agencies proposed substantive changes to their respective trade waste charges. The changes proposed by Sydney Water were designed to simplify the basis for charging for these services and provide it with greater flexibility to allow it to respond to changes within the trade waste system. IPART engaged GHD Pty Limited (GHD) to review Sydney Water's trade waste submission and provide expert advice on the reasonableness of the proposals included. GHD concluded that:

> Sydney Water has developed a justifiable trade waste policy and charges regime. Its current policy is based on the principle of cost recovery and is driven by sophisticated models that consider factors such as cost of transportation, treatment and disposal of trade waste and the threat these substances present to infrastructure and personnel.[109]

GHD estimated the fair cost of providing the services against industry rules on the capital, operating and other costs associated with the management of trade waste. GHD found that Sydney Water's annual administration and inspection fees were comparable to other agencies, biological oxygen demand and suspended solids charges were at the low end of an estimated fair cost, and oil and grease charges were around mid-range of the estimated fair cost. Based on GHD's findings, IPART accepted Sydney Water's trade waste charges' proposal (subject to some minor changes).

For the 2005 Determination, IPART increased trade waste charges by CPI, maintaining the charges in real terms. IPART also agreed to some minor changes to Sydney Water's proposals related to discharging total dissolved solids and pollutants not subject to a formal threat assessment.

[109] GHD, *Review of trade waste pricing proposals by Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council*, June 2003, p 5.

11.7.2 Liquid waste levy introduced by DECC

One submission was received commenting on liquid waste levy recently introduced by the Department of Environment, Conservation and Climate Change (DECC). The Waste Contractors and Recyclers Association of NSW (the Association) noted that a levy was introduced on liquid waste disposals to licensed waste facilities (which is estimated to generate revenue of approximately $4 million per annum). The Association believes that this has significantly increased the costs for industrial waste generators and could result in greater illegal waste disposal to Sydney Water's sewer system. In particular, the Association believes that the cost will burden small liquid waste generators and those from rural areas (given the high cost of transporting liquid waste to treatment plants in Sydney, Wollongong and Newcastle).

The Association requests that:[110]

> Sydney Water and DECC enter into a negotiation for Sydney Water to increase its trade waste charges by a method that equates to a total of $4 million per annum on the basis that this levy is abolished. Sydney Water can then pass the $4 million on to the DECC. …
>
> In the event that you do not adopt the above recommendation, or if you are unsuccessful in convincing the DECC to adopt this recommendation, then for all the above reasons, at the very least we respectfully request that IPART show some moderation when considering any increases and/or changes that will impact on trade waste charges and fees.

At the public hearing, Mr Andrew Doig from the Australian Environment Business Network also notes his concerns:[111]

> … the liquid waste that currently goes to the sewer have been undergoing substantial cost increases over the last two years. This is due to a rationalisation in the liquid waste treatment market, being I suppose the intensive competition that was there up until about 2004/05 has now ended, one of the parties selling their treatment services to another organisation. That has resulted in increases, our members say, anything from twofold to sevenfold in their liquid waste discharges.
>
> On top of that, we recently had the liquid waste levy applied to these types of wastes as well, another $38.60 a tonne, which is going up to about $65 a tonne by 2010. While this is a side path associated with dealing with trade waste issues, it certainly is linked into it from a customer perspective and it is certainly concerning to our members that these prices are so high and reflect in some of the comments it will encourage illegal dumping because Sydney Water's sewers are one of the easiest ways to hide it, unfortunately illegally, and something I hate to say.

110 Waste Contractors and Recyclers Association of NSW submission, 9 October 2007, p 2.

111 Mr Andrew Doig, Australian Environment Business Network, Transcript for public hearing, 7 December 2007.

At the public hearing, Sydney Water committed to conducting further inquiries with DECC on the levy and subsequently wrote to IPART on this matter. A copy of the letter is attached as Appendix H. In that letter, Sydney Water advises that:[112]

> The intent of the Liquid Waste levy is to reduce the generation of potentially dangerous liquid wastes. It is also to provide an economic driver to increase the recovery of the reusable components of trackable liquid waste.
>
> …Trade waste charges are paid by businesses within Sydney to discharge trade wastewater to sewer. The charges cover the cost of managing, transporting and treating trade wastewater. They are unrelated to liquid waste generation and disposal as tracked by DECC.

Sydney Water contends that applying the levy indirectly to all of its trade waste customers would undermine the purpose of the levy. It further contends that this would lead to inequities, noting that it would disproportionately disadvantage trade waste dischargers in the Sydney area (even though the levy applies across NSW) and the estimated 80 per cent of its trade waste customers that are not subject to levy.

While IPART notes the concerns of industry representatives in relation to the liquid waste levy imposed by DECC, it is unable to set trade waste charges to recover the estimated $4 million per annum that DECC expects to collect through the levy. IPART can only set charges to recover the efficient costs that Sydney Water incurs in the provision of trade waste services. Consequently, it is unable to accept the Association's proposal.

11.7.3 IPART's analysis of trade waste charges

Decision

30 IPART's decision for the draft determination is to accept Sydney Water's proposal to maintain existing trade waste charges in real terms over the determination period.

Sydney Water proposes the maintenance of the current structure of trade waste charges and of the level of the charges in real terms. However, no analysis was provided in support of this proposal.

IPART expected that Sydney Water's submission would have identified increases in costs of delivering trade waste services, or at least identified the cost drivers. At the public hearing Sydney Water indicated that:[113]

> ….. the principal reason that we are not seeking larger charges is that our principal operating costs with trade waste are linked to CPI, it is largely labour, and we also don't want to encourage illegal dumping and we are recognising that many businesses have on-site treatment costs before they are permitted to discharge into the sewer network.

112 Letter from Sydney Water to IPART, 30 March 2008.
113 Dr Kerry Schott, Sydney Water, Transcript for public hearing, 7 December 2007.

IPART accepts Sydney Water's proposal to maintain existing trade waste charges in real terms and accepts Sydney Water's contention that this is likely to be more cost reflective. It is also likely to prevent the need for large price increases at the next determination, relative to maintaining trade waste charges in nominal terms (ie, not adjusting for CPI). Furthermore, there was no widespread opposition from stakeholders to this proposal. However, IPART expects Sydney Water to undertake a rigorous assessment of its trade waste costs and revenues for the next determination.

11.8 Charges for Rouse Hill Development Area

Sydney Water provides two additional services to over 17,000 customers in the Rouse Hill development area: access to recycled water and drainage services. The recycled water charge includes a fixed access charge and a usage charge. The drainage charge (now termed the River Management Charge) is a fixed charge for residential properties and a charge based on property size for non-residential properties. As stated in Chapter 10, IPART has decided to maintain the current structure of prices for recycled water services and the River Management Charge.

In September 2006, IPART developed a pricing framework for charging for recycled water and decided that periodic charges in the Rouse Hill area should be revised so that they were consistent with this framework. Applying this framework, IPART set maximum charges for recycled water periodic charges at Rouse Hill that resulted in a usage charge that increased so that it would be equal to 80 per cent of the potable water usage charge by 2008/09. The fixed charge was decreased over the determination period to offset the increase in the usage charge. IPART also decided to maintain the River Management Charge in real terms as determined in the 2005 Determination.

11.8.1 Recycled water charges for Rouse Hill

Decision

31 IPART's decision for the draft determination is to set the recycled water usage charge so that it is 80 per cent of the filtered (potable) water usage charge and to maintain the existing recycled water fixed charge (in real terms) over the determination period.

Sydney Water has not submitted a proposal in relation to the price of recycled water. As discussed in section 10.5, IPART has decided to maintain the current structure of charges and to set the recycled water usage charge so that it is 80 per cent of the filtered (potable) water usage charge, consistent with IPART's 2006 Recycled Water determination. The key reason for establishing this price structure was that during peak usage periods, recycled water supplies cannot always meet demand and have to be topped up with potable water. In the past, around 20 per cent of total recycled water demand has been met by potable water.

Sydney Water has not provided any further evidence that would suggest a significant increase in supply of recycled water in the Rouse Hill Area which would reduce the need to top up supplies with potable water. Given this, IPART considers that it is appropriate to maintain its current approach for charging for recycled water for customers in the Rouse Hill area. This will ensure that prices provide appropriate usage signals to customers in the Rouse Hill area receiving these services.

In relation to the fixed charge, IPART has decided to maintain the current charge (in real terms) over the determination period.

11.8.2 River Management Charge for Rouse Hill

Decision

32 IPART's decision for the draft determination is to reject Sydney Water's proposal and maintain the existing River Management Charge (in real terms) over the determination period.

Sydney Water proposes an increase in the River Management Charge by 0.2 per cent above CPI in 2008/09 and 1 per cent above CPI in each subsequent year of the determination. However, it has not provided any justification for these proposed increases.

IPART considers that Sydney Water has not provided sufficient information to justify price increases above CPI. In the absence of further information, IPART has decided to maintain existing charges (in real terms) over the determination period. However, IPART expects Sydney Water to undertake a rigorous assessment of its costs and revenues for the Rouse Hill River Management service for the next determination.

11.9 Miscellaneous charges

IPART sets miscellaneous charges for the range of ancillary services, including special meter readings, statements of available pressure and flows and applications for water service connection. These are generally services requested by customers when buying and selling properties, building and connecting new plumbing or developing land.

For existing miscellaneous charges, Sydney Water proposed the maintenance of these charges in real terms over the determination period.

Sydney Water also proposed the introduction of two new miscellaneous charges:

- a late payment fee on accounts that remain unpaid for four days after the due date
- a credit card fee to directly recover merchant fees from customers paying by credit card.

Sydney Water also requested that IPART remove price control of two charges for ancillary services:

- Pier supervision applications.
- Concrete easement supervision applications.

11.9.1 Existing charges

Decision

33 IPART's decision for the draft determination is to accept Sydney Water's proposal to maintain existing miscellaneous charges (in real terms) over the determination period.

Sydney Water proposes to increase to its existing miscellaneous charges by CPI (ie, to maintain the charges in real terms) in each year of the determination period.

IPART has previously asked all water agencies to adopt the following formula to calculate the level of charges:

$$\textit{Miscellaneous charge} = \textit{base cost} + \textit{direct material cost}$$

As part of the 2005 price review, IPART engaged RSM Bird Cameron to review the reasonableness of each agency's miscellaneous charges price proposal. The consultant generally supported the methodology applied (and resulting charges) proposed by each water agency.

In the 2005 Determination, IPART generally supported Sydney Water's proposal, though with some minor differences. Unlike previous reviews, IPART also allowed miscellaneous charges to be increased by CPI to avoid large price increases in future determinations.

Given the detailed review of Sydney Water's miscellaneous charges as part of the 2005 Determination, IPART considers that the existing charges should be maintained (in real terms) over the determination period. However, IPART considers that Sydney Water should undertake a detailed review of its miscellaneous charges, in line with the above formula, for the next price review.

11.9.2 Sydney Water's proposed new charges

Late payment fee

Decision

34 IPART's decision for the draft determination is to reject Sydney Water's proposal to introduce a late payment fee.

Sydney Water submitted that the majority (53 per cent) of its customers failed to pay their accounts within the specified 21 days, and proposed the introduction of a $5 late payment fee on accounts that remain unpaid four days after the due date.[114]

Sydney Water claimed that while the administration costs of collecting overdue payments are recovered through its operating expenditure, it is not compensated for the opportunity cost associated with delayed cash flow. IPART disagrees with this contention as interest payments (as a proxy for negative cash flows) are allowed for in the operating allowance. IPART considers that Sydney Water is fully compensated for all costs related to late payments.

Sydney Water also argued that a late payment fee may encourage customers to pay their bills on time. Analysis by Sydney Water found that there was little correlation between customer income and late payment, with low, medium and high income groups represented fairly evenly. Sydney Water suggested that the main reason for late payment was customers neglecting to pay on time. While Sydney Water recognised that it was currently able to apply interest to overdue accounts, it claimed that this charge is too low to provide small customers with an incentive to pay their bills on time.[115]

Sydney Water submitted that the introduction of a late payment fee was most likely to influence customers who currently pay their bill within 22 to 35 days, and would reduce the number of customers receiving a final notice. It claimed that evidence from other utilities also suggested that the introduction of a late payment fee will adjust payment patterns, noting that only 9 per cent of Integral Energy customers and 6 per cent of Energy Australia customers pay a late fee.

IPART notes that other stakeholders did not support Sydney Water's proposal to introduce a late payment fee. For example, PIAC did not believe that it would change behaviour in the manner proposed by Sydney Water. PIAC believed that if a penalty is introduced there should also be an equivalent incentive for early payment.

EWON was also unsupportive of the introduction of a late payment fee. In its comments at the public hearing, EWON stated:[116]

> Through personal experience with working with Telstra on their credit management working party, I watched the late payment fee go from $5 to $7 to $9 to $11 as its initial impact worked for a while but then fell away, so it just kept getting put up. I agree very strongly that a late payment fee without an incentive scheme alongside will not achieve the desired outcome.

114 Sydney Water proposed a similar late payment fee in the 2005 determination.

115 Sydney Water also notes that in can reduce the water pressure to a house as a penalty for non-payment of bills, although this is only done in extreme cases.

116 Mr Chris Dodd, EWON, Transcript for public hearing, 7 December 2007.

PIAC also raised concerns about the size of the proposed penalty fee and argued that $5 is likely to be substantially higher than the cost of putting out a reminder notice. Sydney Water recognises the potential impact of the fee on low income customers and proposed that customers who have identified themselves as experiencing financial hardship would not pay the fee. Pensioners with a concession card, or Veterans Affairs Gold Card holders embossed with TPI/TTI or war widow/widower or Extreme Disablement Adjustment would also not pay the fee.

Based on the comments provided by other stakeholders, IPART is not convinced that a late payment fee would provide a sufficient incentive for customers to pay on time, unless this fee was applied at a level well above cost reflectivity. However, IPART also recognises that the costs associated with late payments are spread across all customers, even those who pay their bills on time, and that this could be considered inequitable. However, given that some cross-subsidies are inherent under the postage stamp pricing approach, this argument alone is not a sufficient reason for supporting the introduction of a late payment fee.

On balance, IPART does not support the introduction of a late payment fee. Sydney Water already recovers the costs associated with late payments through its operating expenditure and IPART is not convinced that the fee would provide sufficient incentive for customers to pay their bills on time. Furthermore, the existence of cross-subsidies is not sufficient to support its introduction.

Credit card fee

Decision

35 IPART's decision for the draft determination is to reject Sydney Water's proposal to introduce a credit card fee.

During the 2006 financial year Sydney Water claims that around 27 per cent of bill payments were made by credit card, which cost it $2.4 million in merchant fees. These fees are recovered through all customers' bills, so customers who don't pay by credit card subsidise those who do.

In order to remove this cross-subsidy, Sydney Water proposed the introduction of a fee of 0.8 per cent (to the billed value of products and services) for payments made by credit card. Sydney Water argued that 0.8 per cent is the current weighted average merchant fee rate for their business. Sydney Water also provided some analysis to show that this is less than that charged by a number of similar utilities and local councils, who charge customers around 1 per cent to pay by credit card.[117]

As the fee would be charged as a percentage of the amount purchased by credit card, the fee would increase as water bills increased. Sydney Water proposed that any increase in revenue from these fees would be offset by reductions in the existing revenue base. Sydney Water also proposed the removal of its current $1,000 limit on

[117] See Sydney Water submission, 14 September 2007, Appendix G.2.

credit card payments, to increase payment options for those customers wishing to continue paying by credit card and to simplify the administration of large accounts by using credit card payment.[118]

IPART notes that there are still six other payment channels available to customers where fees for using the payment service do not apply. However, the fee will impact on those customers who rely on credit cards to manage their bills between their income payments. This may particularly affect some low income customers who face periodic cash flow issues and could result in an increase in the late payment of bills.

IPART also notes that businesses apply different approaches to recover the cost of credit card merchant fees. While some businesses apply a credit card payment fee, other large businesses (such as major retailers and supermarkets) do not tend to charge fees for the use of credit cards. Smaller retail businesses also tend not to charge for credit card fees, although they tend to restrict the use of credit cards to transactions over a specified value. All other water businesses regulated by IPART do not currently charge a credit card fee.

On balance, IPART does not consider that that there is sufficient justification for the introduction of a credit card fee, particularly in light of its potential impact on some low income customers. Furthermore, IPART does not consider Sydney Water's proposal to remove the cross-subsidies associated with merchant fees on credit cards to be a sufficient argument to support the introduction of a credit card fee. Sydney Water is also likely to experience some benefits from customer credit card usage in terms of simplification of administration and improved on-time payment.

11.9.3 Sydney Water's proposed removal of price control on charges for certain services

Decision

36 IPART's decision for the draft determination is to accept Sydney Water's proposal to remove price control on charges for pier supervision application and concrete encasement supervision application.

In its submission, Sydney Water requests that IPART remove price control of the following charges for ancillary services:

- Charge no 34: Pier supervision application. Application for Sydney Water to supervise the piercing of an existing sewer.
- Charge no 35: Concrete encasement supervision application. Application for Sydney Water to supervise the encasement of an existing sewer.

[118] Sydney Water argues that a number of customers circumvent the $1000 limit by making multiple payments.

IPART currently determines fixed application fees and hourly rates for these activities. Sydney Water has accredited a number of external 'Water Servicing Coordinators' to undertake these works and on this basis believes there is no longer a need to regulate these charges. Sydney Water's submission provided no further information on the competitive nature of the services or any analysis of the impact on regulated revenues.

Given the lack of information in its submission, IPART sought further information from Sydney Water on the competitive nature of the services. In response, Sydney Water advised that:

> We have 27 Water Servicing Coordinators (WSCs). Whilst some have only one office, many do work across our whole area of operations. In the Illawarra, there are 3 WSCs with offices there plus more in the Campbelltown area who do work in the Illawarra. There are 3 based at Penrith who do work in the Blue Mountains. Plus there are many more who will do work anywhere.[119]

Sydney Water also provided monthly data on the number of applications that it has received for these services in 2006/07, compared with the first six months of 2007/08, which illustrates a substantial decline in applications. Sydney Water believes that this is further evidence that there is a contestable market in place for these services.[120]

On balance, IPART considers that Sydney Water has provided sufficient evidence to justify the removal of price control for these services on the basis that they are now contestable.

11.10 Minor service extension charges

Decision

37 IPART's decision for the draft determination is to set minor service extension charges based on the methodology set out in the 2005 Determination, with charges to be adjusted annually by the movement in the CPI.

Minor water and sewerage extensions are required where there are areas that do not have access to reticulated sewerage systems or, in some instances, water services. These charges apply to extensions where neither the Backlog Sewerage Determination nor the Developer Charges Determination is applicable.

At the 2003 Determination, IPART established a methodology to apply to minor extensions to water and sewerage networks and this approach was maintained in the 2005 Determination. IPART's decision for the draft determination is to continue to set charges using this methodology, with charges to be adjusted annually by movements in the CPI.

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119 Email from Stuart Wilson, Sydney Water, dated 6 February 2008.
120 Email from Stuart Wilson, Sydney Water, dated 6 February 2008.

11.11 Levying charges on multi-dwelling properties

In its Issues Paper, IPART noted that it had received a number of complaints regarding Sydney Water's application of the determination in respect of charging multi-dwelling properties. IPART requested Sydney Water to conduct a detailed review of the last determination and identify amendments to the determination to remove any potential inequities.

Sydney Water responded to this request in its submission. It indicated that the current arrangement has worked satisfactorily for most residential and commercial strata buildings. However, it indicated that strata title plans are being used is some new situations that do not easily fit the current arrangements. These include, for example:

- individual storage units that have their own title (but with no facilities connecting to the sewer) that can incur a separate sewerage service charge
- 'extensive strata lots', eg, a shopping mall, may create individual strata lots for ATMs, concierge desks, massage tables, storage rooms.

Under IPART's determination, each unit in a multi-dwelling strata titled building pays an individual sewerage service charge even if there are no facilities (eg, a washbasin) directly connected to the sewer.

In regards to the individual storage units, Sydney Water has indicated that it has decided to only set a single charge for buildings that consist solely of storage units. However, it has not been able to reach resolution on the case of 'extensive strata lots'. Sydney Water indicated that it receives title ownership information automatically from the Department of Lands and is not in a position to know the exact usage of each strata lot at any particular time. Further, the type of individual strata lot can change frequently. Sydney Water considers that it would, therefore, be very difficult and expensive to establish a system to track all the different types of strata lots and the changes in usage over time.

Given this, Sydney Water does not propose to change the current arrangements for charging multi-dwelling properties. In defence of this position, Sydney Water has also indicated that all strata lots still receive at least a shared water and sewerage service. IPART recognises the difficulty in establishing charging arrangements that can cater for all the different types of properties and the extent to which the individual lots within the property use Sydney Water's water and sewerage services.

IPART considers that there are likely to be other issues and potential inequities in relation to the charging of multi-dwelling properties, for instance, there are differences in the treatment of properties with respect to charges for water and sewerage services.

While IPART has decided to maintain the existing charging arrangements for the current determination, it intends to conduct an investigation into the water and

sewerage price structures for both residential and non-residential multi-dwelling properties over the course of the new determination.

12 Implications of pricing decisions

Throughout the review process, IPART has considered the impact of maximum prices on Sydney Water, its customers and the environment. It has balanced the interests of each of the following matters in accordance with section 15 of the IPART Act:

- consumer protection—protecting consumers from abuses of monopoly power; standards of quality, reliability and safety of the services concerned; social impact of decisions; effect on inflation
- economic efficiency—greater efficiency in the supply of services; the need to promote competition; effect of functions being carried out by another body
- financial viability—rate of return on public sector assets including dividend requirements; impact on pricing of borrowing, capital and dividend requirements of agencies
- environmental protection—promotion of ecologically sustainable development via appropriate pricing policies; considerations of demand management and least-cost planning.[121]

As already mentioned, IPART has also received direction from the Government requiring it to pass certain costs associated with securing Sydney's water supplies into prices. Overall, IPART has placed equal weight on each of the section 15 factors and is satisfied that the implications of its findings for customers and the environment are appropriately balanced against financial outcomes for Sydney Water, within the context of the directions that it has received from Government.

This chapter explains IPART's assessment of the implications of this determination. Section 12.1 discusses the implications for customers; sections 12.2 and 12.3 outline the implications for service standards and financial outcomes respectively, and section 12.4 details the implications for the environment.

[121] The section 15 requirements are listed in full in Appendix A.

12.1 Implications for customers

In reaching its decisions, IPART considered the likely impact on Sydney Water's residential, commercial and industrial customers. In particular, it considered the affordability of water services for high and low water users and vulnerable customers, and the quality of the services customers receive. It considers that these impacts are well balanced against the other matters it is required to consider under section 15.

IPART is conscious of the economic importance of water and the long term implications for customers of sustainable water, sewerage and stormwater services. It is also conscious that Sydney Water serves a large number of customers, and that the household income of these customers varies considerably.

The size of Sydney Water's forecast capital and operating expenditures will mean that customers will face significant increases in the cost of water, sewerage and stormwater drainage services, with the largest increases being in 2008/09. Combined water and sewerage bills for all users are expected to increase in each year of the determination. However, IPART considers that these increases are warranted to ensure Sydney Water's financial viability through a period of intensive capital expenditure and to ensure that customers have access to a sustainable water supply of appropriate quality and to the other services provided by Sydney Water.

There is an increasing need to rely on water sources that are not rainfall dependent and the cheaper sources of water have already been accessed. The amount that can be drawn from the catchment dams in each year (known as the system yield – see section 10.2.1 above) has decreased, while Sydney's population has increased. This has placed increased pressure on existing water sources and prices need to rise to provide a greater level of security of supply into the future.

IPART has decided on a pricing structure that sees the progressive removal of the Tier 2 water usage charge over the determination period.

The key implications for customers are set out in the following sections.

12.1.1 Residential customers

IPART's analysis of the impact on Sydney Water's residential customers concentrated on the overall impact on total bills. It looked at how the increased bills compare with the past costs of these services, and how the size of these bill increases vary with water usage.

Between 2005/06 and 2007/08, water and sewerage bills for residential customers (with average water consumption of 200kL per year[122]) increased by an average of 0.9 per cent per annum (in real terms). Residential customers will face additional increases in their water and sewerage bills, with the bill of a household with average water consumption[123] increasing by a total of $203 (or 28 per cent) in real terms by the end of the determination period[124] (or 6.4 per cent per annum on average). The largest increase in bills will be in 2008/09 and 2009/10, reflecting the costs related to the desalination plant.

The amount of the increase will vary depending on the household's water consumption. For example, households with consumption of 100kL per annum (whose bills increased by 0.1 per cent (real) on average between 2005/06 and 2007/08) will face real bill increases of 6.0 per cent annually (on average) over the determination period. On the other hand, households with consumption of 750kL per annum (whose bills increased by 5.6 per cent (real) on average between 2005/06 and 2007/08) will face real bill increases of 4.3 per cent annually (on average) over the determination period.

Tables 12.1, 12.2 and 12.3 below set out the impacts on the bills of individually metered residential customers with various levels of water usage.

Table 12.1 Individually metered residential properties with a water service – impact of prices ($real, 2007/08)

Water use (kL)	2007/08	2008/09		2009/10		2010/11		2011/12	
	Bills	Bills	Increase	Bills	Increase	Bills	Increase	Bills	Increase
100	190	219	15.1%	249	13.7%	270	8.4%	284	5.2%
200	324	373	15.1%	421	12.9%	452	7.4%	467	3.3%
300	458	527	15.1%	593	12.6%	634	6.9%	650	2.5%
400	592	681	15.1%	765	12.4%	816	6.7%	833	2.1%
750	1,232	1301	5.6%	1,367	5.1%	1,453	6.3%	1,474	1.4%

[122] The results of IPART's 2006 Household Survey found that average residential household consumption was 201kL in 2006, compared with 249kL in 2003. See IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra – Results from the 2006 household survey*, November 2007, p 33.

[123] The results of IPART's 2006 Household Survey found that average residential household consumption was 201kL in 2006, compared with 249kL in 2003. See IPART, *Residential energy and water use in Sydney, the Blue Mountains and Illawarra – Results from the 2006 household survey*, November 2007, p 33.

[124] For those customers that also pay for stormwater services, the increase is $202 or 26 per cent for water, sewerage and stormwater services.

Table 12.2 Individually metered residential properties with water and sewerage services – impact of prices ($real, 2007/08)

Water use (kL)	2007/08	2008/09		2009/10		2010/11		2011/12	
	Bills	Bills	Increase	Bills	Increase	Bills	Increase	Bills	Increase
100	598	673	12.6%	705	4.8%	732	3.8%	752	2.7%
200	732	827	13.0%	877	6.1%	914	4.2%	935	2.3%
300	866	981	13.3%	1,049	6.9%	1,096	4.4%	1,118	2.0%
400	1,000	1135	13.5%	1,221	7.6%	1,278	4.6%	1,301	1.8%
750	1,639	1755	7.0%	1,823	3.9%	1,915	5.0%	1,941	1.4%

Table 12.3 Individually metered residential properties with water, sewerage and stormwater services – impact of prices ($real, 2007/08)

Water use (kL)	2007/08	2008/09		2009/10		2010/11		2011/12	
	Bills	Bills	Increase	Bills	Increase	Bills	Increase	Bills	Increase
100	642	717	11.7%	749	4.5%	775	3.5%	795	2.6%
200	776	871	12.3%	921	5.7%	957	4.0%	978	2.2%
300	909	1,025	12.7%	1,093	6.6%	1,139	4.3%	1,161	1.9%
400	1,043	1,179	13.0%	1,265	7.3%	1,321	4.5%	1,344	1.7%
750	1,683	1,799	6.9%	1,867	3.8%	1,958	4.9%	1,985	1.4%

As shown in Table 12.4 below, water and sewerage bills have been a relatively constant proportion of average earnings since 1996/97. IPART's analysis assumes that earnings will increase (in real terms) from 2007/08 onwards at a rate of 1.5 per cent per annum. In this context, average bills will increase from 1.5 per cent of average earnings in 2007/08 to 1.8 per cent in 2001/12.

Table 12.4 Average bills as a proportion of average earnings

Year	Average water & sewerage bill [a] ($real, 2007/08)	Average earnings NSW [b] ($real, 2007/08)	Average bill as a proportion of average earnings
1996/97	670.48	41,937	1.6%
1997/98	694.46	42,705	1.6%
1998/99	704.92	43,778	1.6%
1999/00	707.65	44,922	1.6%
2000/01	688.34	44,555	1.5%
2001/02	687.78	44,661	1.5%
2002/03	679.74	45,644	1.5%
2003/04	684.11	46,572	1.5%
2004/05	685.39	47,457	1.4%
2005/06	718.93	47,845	1.5%
2006/07	729.37	48,340	1.5%
2007/08	731.78	49,065	1.5%
2008/09	826.97	49,801	1.7%
2009/10	877.04	50,548	1.7%
2010/11	913.5	51,306	1.8%
2011/12	934.58	52,076	1.8%

a Annual water and sewerage bill for a customer that consumes 200kL per annum.

b Annual average gross (before tax) earnings of all employees. Average of four quarters ending August.
Source: Australian Bureau of Statistics, *Average Weekly Earnings Australia, 6302.0*, November 2007.

Note: Average earnings are assumed to increase at 1.5% per annum from 2006/07 levels (in real terms) from 2007/08 onwards.

12.1.2 Commercial and industrial customers

As with residential customers, IPART's analysis of the impact of its decisions on non-residential customers considered the overall impact on these customers' total bills. However, because commercial and industrial customers are more diverse in terms of their water usage patterns, it is more difficult to draw general conclusions about the impact of IPART's decision on this group of customers.

For commercial and industrial customers, the combined water and sewerage bill of a customer with a 20mm meter that consumes 300kL of water per year will increase by a total of $252 (or 29 per cent) in real terms by the end of the determination period. The bill of a customer with an 80mm meter that consumes 10,000kL of water per year will increase by a total of $6,583 (or 21 per cent).

Tables 12.5, 12.6 and 12.7 below set out the impacts on the bills of customers with 20mm meters that consume 300kL of water per year, customers with 32mm meters that consume 1,000kL of water per year and customers with 80mm meters that consume 10,000kL of water per year.

Table 12.5 Individually metered non-residential properties with a water service – impact of prices ($real, 2007/08)

Water use (kL)	Meter size	2007/08	2008/09		2009/10		2010/11		2011/12	
		Bills	Bills	Increase	Bills	Increase	Bills	Increase	Bills	Increase
300	20mm	458	527	15.1%	593	12.6%	634	6.9%	650	2.5%
1,000	32mm	1,483	1,706	15.0%	1,918	12.4%	2,046	6.7%	2,090	2.1%
10,000	80mm	14,289	16,437	15.0%	18,438	12.2%	19,614	6.4%	19,922	1.6%

Note: The discharge factor is assumed to be 80%.

Table 12.6 Individually metered non-residential properties with water and sewerage services – impact of prices ($real, 2007/08)

Water use (kL)	Meter size	2007/08	2008/09		2009/10		2010/11		2011/12	
		Bills	Bills	Increase	Bills	Increase	Bills	Increase	Bills	Increase
300	20mm	866	981	13.3%	1,049	6.9%	1,096	4.4%	1,118	2.0%
1,000	32mm	3,045	3387	11.2%	3,603	6.4%	3,745	3.9%	3,804	1.6%
10,000	80mm	30,664	33,553	9.4%	35,578	6.0%	36,842	3.6%	37,247	1.1%

Note: The discharge factor is assumed to be 80%.

Table 12.7 Individually metered non-residential properties with water, sewerage and stormwater services – impact of prices ($real, 2007/08)

Water use (kL)	Meter size	2007/08	2008/09		2009/10		2010/11		2011/12	
		Bills	Bills	Increase	Bills	Increase	Bills	Increase	Bills	Increase
300	20mm	980	1,095	11.8%	1,163	6.2%	1,210	4.0%	1,232	1.8%
1,000	32mm	3,159	3,501	10.8%	3,717	6.2%	3,859	3.8%	3,918	1.5%
10,000	80mm	30,778	33,667	9.4%	35,692	6.0%	36,956	3.5%	37,361	1.1%

Note: The discharge factor is assumed to be 80%.

12.1.3 Social programs

The price increases decided on will particularly impact on financially disadvantaged customers. Sydney Water's current social program includes a range of measures to assist vulnerable customers, including:

- **Free residential retrofits** – Sydney Water offers a retrofit program where domestic properties are fitted with water efficient devices free of charge if they meet certain eligibility criteria.
- **Extended payment arrangements** – Sydney Water offers customers flexible extended payment terms and a range of payment options to help them manage their bills.

- **No interest loan scheme** – Sydney Water contributes funds to this scheme to assist low-income households to purchase water-efficient appliances. Households that take out a loan are also eligible to receive the $150 rebate that Sydney Water offers to all customers who purchase a water-efficient washing machine.
- **Payment Assistance Scheme** – under this scheme, participating welfare agencies assess the financial position of customers and provide payment vouchers to customers in financial difficulty.
- **Pensioner rebates** – eligible pensioners currently receive a rebate on the quarterly service charge for water, sewerage and stormwater. Sydney Water proposes to increase the sewerage rebate (see below).

The Combined Pensioner and Superannuants Association raised concerns about the ability of pensioners to meet the costs associated with price rises above CPI. At the public hearing for this price review the Association stated that:[125]

> … the quantum standard of retirement living developed by Westpac and the Association of Superannuation Funds of Australia sets a retirement income for a single person at $18,500 per year and $25,500 for couples. The pension currently offers single people $14,000 max and $23,000 for couples.
>
> So a lot of people, the vast majority of pensioners, particularly single people, are living on subsistence incomes and if you whack a 33 per cent increase on top of their water bill, even though the effect is still measured in hundreds of dollars, it really tips them over the edge and can have the effect of early admissions to nursing homes because that is the only affordable thing.
>
> So we would ask the tribunal to really consider the effect any price increase above CPI will have on the people that we represent, that is, aged pensioners and also disability support pensioners.

IPART considers that customer-impact mitigation is primarily the responsibility of the Government as part of its broader social policy. IPART recommends that the Government evaluates the current suite of social programs to ensure that appropriate measures are in place to assist financially disadvantaged customers. IPART recommends the progressive removal of the large household rebate, given its decision to remove the Tier 2 water usage charge during the determination period.

Pensioner rebates

In recent correspondence, Sydney Water advised that it proposes to seek increases in the sewerage pensioner rebate (currently 81 per cent of the sewerage quarterly service charge) to keep pensioner bill increases proportionally in line with those of non-pensioners.

[125] Mr Paul Versteege, Combined Pensioners and Superannuants Association, Transcript for public hearing, 7 December 2007.

This means that if the average annual water and sewerage bill[126] for a non-pensioner increases from $732 (in 2007/08) to $935 (in 2011/12), the average pensioner's annual bill will rise from $337 (in 2007/08) to $430 (in 2011/12) – an increase of 28 per cent (in real terms) for both bills. This requires sewerage service rebate percentages to increase to 81.5 per cent, 86.4 per cent, 87.1 per cent and 85.6 per cent of sewerage service charges for each year to equalise the increases across those four years.

If these rebates are used for other consumption levels (eg, 500kL per annum), the relationship between non-pensioner and pensioner bills is not maintained. However, IPART notes that this program is a matter for Government policy.

12.2 Service standards

Apart from considering the impact of its decisions on increases to customers' bills, IPART sought to ensure that its decisions would not adversely affect the standards of service delivered to customers. IPART has set prices in the expectation that current service levels will be maintained and that cost reductions and efficiency savings will not be obtained at the expense of service standards. Further, it expects the reliability of supply to increase due to the construction of the desalination plant and the recycling water schemes.

Sydney Water is licensed under the *Sydney Water Act 1994*. The Act requires Sydney Water to hold an operating licence issued by the Minister and reviewed annually by IPART. The licence itself contains a number of standards that Sydney Water must meet or risk penalties associated with a breach of licence conditions. Sydney Water's submission must identify expenditure associated with its regulatory requirements to ensure that adequate funding is made available for it to meet its obligations under both its operating and environmental licences.

Performance indicators are now incorporated into Sydney Water's operating licence and are reviewed as part of the annual audit process.[127]

In addition, IPART has determined that the output measures introduced in the 2005 Determination to link expenditure with deliverables will be continued.[128] These will assist IPART to identify how expenditure proposals will enable Sydney Water to meet its regulatory requirements. A list of output measures for Sydney Water is set out in Appendix E.

[126] Based on 200kL water consumption per annum.

[127] The 2006/07 audit was completed in December 2007. The report can be accessed at www.ipart.nsw.gov.au.

[128] The output measures will be subject to some amendments to reflect the changes in Sydney Water's capital program and are discussed more fully in Chapter 4.

12.3 Financial outcomes

The decisions made by IPART for this determination should not adversely affect the ability of Sydney Water to operate, maintain, renew and develop the assets required to deliver the regulated services. Sydney Water has a large capital expenditure program over the determination period which requires a large injection of debt to fund it. Despite this, Sydney Water will be able to achieve an investment grade credit rating by the end of the determination period.

Sydney Water's submission also raises concerns regarding the need to ensure that IPART's prices provide sufficient funds are available to maintain and renew assets. This issue is discussed in Appendix I.

12.3.1 Comparison of notional versus targeted revenue

Table 12.8 shows the comparison of the notional revenue as set out in Chapter 5 of this report with the 'target' revenue likely to be generated by the agency's prices.

Table 12.8 NPV of cost not recovered for Sydney Water ($ million, 2007/08)

Financial year	2008/09	2009/10	2010/11	2011/12	Total
Notional revenue requirement	1,802	1,994	2,055	2,086	7,937
Target revenue	1,797	1,990	2,050	2,081	7,918
NPV of costs not recovered					(16.7)

The difference between the notional revenue requirement and the target revenue is largely due to the decision on sewerage usage charges discussed in section 10.3 and to a lesser extent, stormwater charges, discussed in section 11.6. Overall, the target revenue is close to the notional revenue requirement in each year.

12.3.2 Impact on rate of return

Given the decisions made on pricing mean that the notional revenue is largely achieved in each year, the real pre-tax rate of return on Sydney Water's regulatory asset base (RAB) is expected to be the target rate of 7.1 per cent for each year of the determination period. This calculation is based on the assumptions used in IPART's modelling of the financial impacts of its pricing decisions and depends on Sydney Water achieving the efficiency targets IPART has set.

12.3.3 Overall financial strength as assessed by investment category ratings

IPART analysed a range of financial indicators that are commonly used by credit rating agencies to assess an entity's financial capacity and ability to service and repay debt. The Government believes that a BBB rating is the minimum target rating to ensure financial viability. In completing its analysis of financial indicators, IPART has assumed dividend payout ratios consistent with Sydney Water's dividend payment projections.

IPART's analysis and financial modelling indicate that the maximum prices set in the determination will enable Sydney Water to achieve a BBB rating by the end of the determination period (see Table 12.9). The lower financial ratings achieved in earlier years of the determination period are predominantly due to the large amount of debt required to fund the desalination plant (which is fully debt funded). Analysing Sydney Water's financial ratios without the desalination plant indicate that Sydney Water would achieve a BBB rating in each year of the determination period.

Table 12.9 Financial indicators and credit ratings for Sydney Water (inclusive of desalination plant)

	2008/09	2009/10	2010/11	2011/12
Ability to service debt				
1. EBITDA interest cover	2.25	2.43	2.39	2.40
NSW Treasury ratings	BBB	BBB	BBB	BBB
2. Funds from operations interest coverage	2.00	2.17	1.94	2.06
Standard and Poors US ratings (1995)	BBB	BBB	BBB	BBB
3. Pre-tax interest coverage	1.73	1.85	1.82	1.83
Standard and Poors US ratings (1995)	BBB	BBB	BBB	BBB
Ability to repay debt				
4. Funds flow net debt payback	11.34	9.86	9.84	9.71
NSW Treasury ratings	BB	BB	BB	BB
5. Funds from operations/total debt (%)	7%	9%	7%	8%
Standard and Poors US ratings (1995)	BB	BB	BB	BB
6. Debt gearing (regulatory value)	45%	45%	45%	45%
NSW Treasury ratings	A+	A+	A+	A+
Standard and Poors US ratings (1995)	AA	AA	AA	AA
Ability to finance investment from internal sources				
7. Internal financing ratio	22%	35%	47%	50%
NSW Treasury ratings	B	B	BB	BB+
8. Net cash flow/capital expenditure (%)	24%	38%	38%	48%
Standard and Poors US ratings (1995)	BB	BBB	BBB	BBB
Overall score and rating				
Total score	3.25	3.25	3.75	4
Overall rating	BB+	BB+	BB+	BBB

Note: NSW Treasury has recently revised its ratings methodology. IPART's final report will reflect these revisions.

12.3.4 Payment of dividends

In its submission Sydney Water raised concerns about its long term financial viability and has emphasized the need for price increases to maintain its financial viability. Sydney Water has projected an average dividend payout ratio of 52 per cent over the determination period, based on its dividend payments to NSW Treasury and its estimate of after tax profit.

Based on the prices in this determination, IPART's modelling indicates that Sydney Water will be able to maintain a 52 per cent dividend payout ratio and a BBB credit rating by 2011/12 if the outcomes and targets set out in this report are achieved.

IPART notes that the dividend payout ratio of 52 per cent projected by Sydney Water is substantially below the dividend payout ratios of approximately 75 per cent projected in past determinations. This lower dividend payout ratio, however, is warranted given the significant capital expenditure program being proposed by Sydney Water. However, the exact level of dividends and, therefore Sydney Water's financial structure, is a matter for negotiation between Sydney Water and the NSW Government.

12.4 Implications for the environment

The Government is responsible for determining any negative environmental impacts and imposing standards or requirements on Sydney Water to address them. For instance, the Department of Environment and Climate Change (DECC)[129] is responsible for setting standards for, and monitoring the environmental impacts of, the effluent it discharges from Sydney Water's treatment plants and sewerage systems.

The Government has also established a Climate Change Fund which, among other things, provides rainwater tank rebates and other incentives for households to become water-wise. Furthermore, the Government released the Metropolitan Water Plan in 2006, which sets out its strategies to manage the sustainable supply of water to the Sydney region. The plan includes a number of projects which aim to improve environmental outcomes, for instance, environmental flow programs to protect river health.

Examples of Sydney Water's environmental related programs include:

- **SewerFix** – this program focuses on repairing sewer main chokes but also on minimising repeat impacts on the environment and customers.
- **Wet Weather Overflow Abatement Program** – this program is designed to prevent repeat wet weather overflows to customer properties and sensitive environmental sites.
- **Active Leak Reduction** – this program began in 1999 as one component of Sydney Water's strategy to reach its operating licence water conservation targets.
- **Renewable Energy Generation Program** – this program includes bio-gas fired generation at numerous sewage treatment plants (STPs) and hydro-electricity generation at Prospect Water Filtration Plant, North Head STP and other locations. The desalination plant will be also be powered by renewable energy.

IPART allows Sydney Water to fully recover, through its prices, the costs it efficiently incurs in meeting its environmental obligations.

[129] Formerly the Department of Environment and Conservation (DEC).

Appendices

A Matters to be considered by IPART under section 15 of the IPART Act

In making determinations IPART is required by the IPART Act 1992 to have regard to the following matters (in addition to any other matters IPART considers relevant):

a) the cost of providing the services concerned

b) the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services

c) the appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales

d) the effect on general price inflation over the medium term

e) the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers

f) the need to maintain ecologically sustainable development (within the meaning of section 6 of the *Protection of the Environment Administration Act 1991*) by appropriate pricing policies that take account of all the feasible options available to protect the environment

g) the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets

h) the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body

i) the need to promote competition in the supply of the services concerned

j) considerations of demand management (including levels of demand) and least cost planning

k) the social impact of the determinations and recommendations

l) standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

B Letter from Premier

Premier of New South Wales
Australia

13 JUN 2007

Dr Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB POST OFFICE NSW 1230

Dear Dr Keating

Pursuant to section 12 of the *Independent Pricing and Regulatory Tribunal Act* 1992, I write to request the Independent Pricing and Regulatory Tribunal (the Tribunal) to make a new price determination for Sydney Water Corporation's *monopoly services*.

My intention is for the Tribunal to make a full determination, which considers all aspects of Sydney Water's revenue and expenditure. The determination should take into account the effects of climatic conditions on Sydney Water's revenue position since the current determination was made on 1 October 2005. The determination should also take into account the desalination project being undertaken by Sydney Water. Sydney Water is already incurring costs relating to this project, and as such I request that the determination be made in a timeframe that is consistent with the construction and commissioning of the project, and the financial sustainability of Sydney Water. The determination should consider financial information that will become available on the award of contracts for the desalination project.

The determination should also take into account several recycling projects, including the Western Sydney Recycled Water Initiative Replacement Flows Project and Camellia Recycled Water Project. Other matters, such as the extension of the Water Savings Fund as part of the new Climate Change Fund and the extensions to existing rebates, should also be considered when making the new determination.

Yours sincerely

Morris Iemma MP
Premier

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TEL: (02)9228 5239 FAX: (02)9228 3935 URL: www.premiers.nsw.gov.au G.P.O. BOX 5341, SYDNEY 2001

C Section 16A direction (Desalination Plant)

New South Wales

The Hon Nathan Rees MP
Minister for Emergency Services
Minister for Water Utilities

Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO Box Q290
QVB POST OFFICE NSW 1230

Dear Dr Keating

The Premier has written to the Independent Pricing and Regulatory Tribunal (the Tribunal) to request it, under section 12 of the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act), to make a new pricing determination for Sydney Water Corporation.

The Government's intention is that the new determination will consider a range of projects that Sydney Water is undertaking to address the ongoing drought conditions and to secure Sydney's long-term water supply.

Sydney Water has already incurred costs to implement water savings measures and to plan for recycled water projects, such as the Replacement Flows Project of the Western Sydney Recycled Water Initiative and the Camellia Recycled Water Project. A list of these projects is at Attachment A. Sydney Water is implementing these projects at the Government's request. I advise the Tribunal that it is the Government's intention for Sydney Water to recover the cost of these projects through its prices.

The cost of the desalination plant at Kurnell Peninsula should also be recovered through Sydney Water's prices. I have directed Sydney Water, under section 20P of the *State Owned Corporations Act 1989*, to construct the desalination plant and associated distribution infrastructure. Pursuant to section 16A of the IPART Act, I direct the Tribunal, when it determines the maximum price for government monopoly services provided by Sydney Water, to include in that price an amount representing the efficient cost of complying with the requirements imposed on Sydney Water to arrange for:

1. The construction of a desalination plant on the Kurnell Peninsula (and associated infrastructure) for the supply of an annual daily average production of up to 250 mega-litres of drinking water per day (scaleable to 500 mega-litres per day), such plant and associated infrastructure to be constructed in accordance with any approval issued by the Minister for Planning under the *Environmental Planning and Assessment Act 1979*; and

2. The construction of distribution pipelines capable of delivering 500 mega-litres per day across Botany Bay for connection with Sydney Water's existing distribution network in accordance with any approval issued by the Minister for Planning under the *Environmental Planning and Assessment Act 1979*.

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I also intend to direct Sydney Water to implement the Replacement Flows Project of the Western Sydney Recycled Water Initiative and the Camellia Recycled Water Project. In due course, I will write to direct the Tribunal to include the efficient costs of these projects in Sydney Water's prices.

Yours sincerely

Nathan Rees

Level 25, 9 Castlereagh Street, Sydney NSW 2000
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Attachment A

Water Savings Projects

Project	Description	Estimated cost
Enhanced Water Savings Fund	To assist the implementation of actions identified by high water users (businesses and councils).	$11.875m
Expansion of existing **DoH retrofit program**	Retrofit water savings devices to an additional 50,000 Dept of Housing dwellings.	$7.250m
Water efficient **Government buildings**	Water efficiency audits to be conducted on high water use government buildings such as hospitals, correctional centres, TAFES.	$3m (Total project costs $7.389m. Remainder to be funded through agency application to the Treasury GEEIP Fund).
Washing Machine Rebate (one year)	$150 rebate for purchase of water efficient front loading washing machines.	$4.625m
School Leak Detection Trial	Trial of monitoring and alarm systems for schools to provide alerts when water use suddenly rises above pre-set levels.	$0.320m
EOI and subsequent tender if appropriate for each of three components of the **WSRWI**	Use of the available effluent from Penrith, St Marys and Quakers Hill STPs (i) to replace flows currently released from Warragamba Dam, (ii) to provide recycled water to new growth in the North West Sector through dual reticulation (iii) to provide for recycled water schemes which are local to the STP's.	No quantum of funds in Minute. Planning costs of $1.3m for 2005/06 and estimated $7.9m for 2006/07.
Further investigations into **local recycling projects**	Local water recycling projects – at Wollongong, Quakers Hill, Penrith, St Mary's and Botanical Gardens.	No quantum of funds in Minute. Planning costs of $0.5m for 2005/06 and estimated costs of $1.4m for 2006/07
Registration of interest be released for **Camellia** (and that SOPA expansion be considered in light of response to Camellia)	Provision of recycled water to large water using industries in the Camellia and Smithfield area	No quantum of funds in Minute. Planning costs of $0.6m for 2005/06 and estimated costs of $1.5m for 2006/07.
Kurnell recycling project	Provision of recycled water to two industrial customers in the Kurnell area	$5m
Extension of washing machine rebate to July 2008	$150 rebate to cover the difference in cost between water efficient front loading washing machines and equivalent sized older style top loading machines.	$9.1m
Increase in the rebate for connecting a **rainwater tank to internal plumbing**	Increasing the rebate from $150 to $300 to encourage residents to connect rainwater tanks to internal plumbing for use in toilets or laundries.	$1.6m

D Section 16A direction (Replacement Flows Project)

New South Wales

The Hon Nathan Rees MP
Minister for Emergency Services
Minister for Water Utilities

RECEIVED
23 AUG 2007
INDEPENDENT PRICING

SW Ref: SD 002243

Dr Michael Keating AC
Chairman
Independent Pricing and Regulatory Tribunal
PO BOX Q290
QVB POST OFFICE NSW 1230

17 AUG 2007

Dear Dr Keating

I refer to the Premier's request under section 12 of the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act) that the Tribunal make a new pricing determination for Sydney Water Corporation.

As you are aware, the Government's intention is that the new determination will consider a range of projects that Sydney Water is undertaking to address the ongoing drought conditions and to secure Sydney's long term water supply.

I have directed Sydney Water, under section 20P of the *State Owned Corporations Act 1989*, to construct, operate and undertake the Western Sydney Recycled Water Initiative Replacement Flows Project. The project consists of;

- an Advanced Water Treatment Plant with interconnecting systems from Penrith, St Marys and Quakers Hill Sewage Treatment Plants;
- associated infrastructure and a pipeline from the treatment plant; and
- a pilot plant at St Mary's Sewage Treatment Plant and associated infrastructure.

Pursuant to section 16A of the IPART Act, I direct the Tribunal, when it determines the maximum price for Government monopoly services provided by Sydney Water, to include in that price an amount representing the efficient cost of complying with the Direction, including the ongoing operating costs of the project.

As you are aware, it is also the Government's intention for costs relating to the Camellia Recycled Water scheme be included in the Tribunal's determination. Sydney Water is finalising the tenders for this project and once this process has concluded I intend to issue a direction to Sydney Water under section 20P of the SOC Act and to the Tribunal under section 16A of the IPART Act.

Yours sincerely

Nathan Rees MP
Minister for Water Utilities
Minister for Emergency Services

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E Output measures

	Unit
Output (or activity) Measure - water services	
Renewal of critical water mains	km
Renewal of distribution mains	km
New mains laid by SWC	km
New recycled mains laid by SWC	km
Pressure control areas established	no.
Bulk water meters: - refurbished	no.
- new	no.
Average leakage for the year 2009	ML/day
Pumping Station Substantial Renewals	no.
Renewal of customer water meters	no.
Service Reservoirs Substantial Renewals - roof refurbishments	no.
Reservoir relining	no.
Output (or activity) Measure - wastewater services	
Repair collapsed sewers	km
Renew critical mains	km
Meet spill frequency of dry & wet weather overflows at sewage pumping stations	
Comply with DEC effluent standards	
Install chemical dosing plants for sewerage systems	no.
Rehabilitate sewers at properties subject to repeat overflows	km
Refurbish WWTWs	
Install/amplify sewers to serve new development	
Increase capacity at WWTWs	
Decommission WWTWs	
Renew old telemetry at WWTW	
Upgrade Biosolids Plant	
Output (or activity) Measure - stormwater services	
Complete SEIP projects and Install gross pollutant traps	
Complete Alexandria Canal Improvements to satisfaction of DIPNR by 2009	

This table relates to IPART's decision to require Sydney Water to establish target levels for the output measures, as discussed in section 4.6.

F Weighted Average Cost of Capital (WACC)

There are several approaches for calculating the appropriate rate of return on the RAB. IPART's preferred approach is to use the Weighted Average Cost of Capital (WACC) to determine an appropriate rate of return range. The WACC for a business is the expected cost of the various classes of capital (debt and equity), weighted to take into account the relative share of debt and equity in the total capital structure. As with previous determinations, IPART has used a real pre-tax WACC.[130]

There are a number of input parameters to consider in determining an appropriate WACC range. Interest rates, inflation and debt margin are dependent on current market rates. The market risk premium, tax rate and dividend imputation factor do not vary with the nature of the business. However, the equity beta, capital structure and debt margin vary with the nature of the business.

IPART's decisions for each of these parameters for the draft determination are discussed below. For the final determination, IPART will update the WACC parameters to reflect market conditions at that time. This appendix also discusses the concerns raised by Sydney Water and Alinta regarding the calculation of the risk free rate.

F.1 IPART's past WACC decisions

Table F1 below shows the final parameters adopted by IPART in the 2005 and 2003 Metropolitan Water decision, the 2004 Electricity Distribution decision and more recently, the 2007 Electricity Retail and the 2006 Bulk Water decisions.

IPART's 2005 Metropolitan Water final decision included an increase in the market risk premium (MRP) and the equity beta parameters compared to its previous decisions. These parameters are highlighted in the table.

[130] The real pre-tax formula is presented in recent IPART determinations such as *Bulk Water Prices for State Water Corporation and Water Administration Ministerial Corporation from 1 October 2006 to 30 June 2010 – Final Report*, September 2006, Appendix D.

Table F.1 Rate of return parameters – past decisions

Parameter	2007 Electricity Retail (30 April 2007)	2006 Bulk water (22 Aug 2006)	2005 Metropolitan water (2 Aug 2005)	2004 Electricity Distribution (6 May 2004)	2003 Metropolitan water (15 April 2003)
Nominal risk free rate	5.91%	5.8%	5.2%	5.9%	5.1%
Real risk free rate	2.71%	2.4%	2.6%	3.3%	2.9%
Inflation	3.12%	3.3%	2.5%	2.5%	2.2%
Market risk premium	5.5 - 6.5%	5.5 – 6.5%	5.5-6.5%	5.0 – 6.0%	5.0 – 6.0%
Debt margin	0.98 - 1.34%	1.1 – 1.3%	1.17 - 1.27%	0.9 – 1.1%	0.7 – 1.0%
Debt to total assets	30 – 40%	60%	60%	60%	60%
Dividend imputation factor (gamma)	0.5 – 0.3	0.5 – 0.3	0.5 - 0.3	0.5	0.5 – 0.3
Tax rate	30%	30%	30%	30%	30%
Equity beta	0.8 – 1.2	0.8 – 1.0	0.80 – 1.0	0.78 – 1.11	0.65 – 0.90
Cost of equity (nominal post-tax)	10.3 – 13.7%	10.2 – 12.3%	9.6 - 11.7%	9.8 – 12.6%	8.4 – 10.5%
Cost of equity (nominal pre-tax)	6.9 – 7.3%	6.9 – 7.1%	6.4 – 6.5%	6.9 – 7.1%	5.8 – 6.1%
WACC range (real pre-tax)	7.2 – 9.9%	5.5 – 6.9%	5.7 - 7.1%	6.1 – 7.5%	5.2 – 6.7%
WACC (real pre-tax midpoint	8.6%	6.5%	6.3%	6.75%	5.6%

As it can be seen from the table above, there has been a wide variation in the WACC range that IPART has decided on over the years. This is not as surprising given that some parameters are based on market observations and consequently reflect prevailing market conditions. IPART considers that there is strong merit in maintaining a consistent approach to the calculation of the cost of capital across regulatory decisions. This has begun to emerge over the past few decisions as highlighted in Table F.1. Such inter-temporal consistency reduces regulatory risk and its associated costs. Hence, there is a presumption that unless an alternative approach to the calculation of a WACC parameter is demonstrated to be clearly superior, the existing approach adopted by IPART should be preferred.

F.2 Market risk premium

Decision

38 IPART's decision for the draft determination is to adopt a MRP range of 5.5 to 6.5 per cent for the purpose of calculating an appropriate rate of return to apply for Sydney Water.

The Market Risk Premium (MRP) represents the additional return over the risk free rate of return that an investor requires for the risk of investing in a diversified equity portfolio. SWC has proposed a midpoint MRP value of 6 per cent consistent with IPART's past assumptions.

As Table F.1 shows, the two most recent decisions in Electricity Retail and Bulk Water, IPART has maintained an MRP range of 5.5 to 6.5 per cent. IPART has always maintained the use of a range rather than a point estimate due to the inherent uncertainty in estimating a MRP for an unlisted business.

IPART believes that there is no new information arising out of the submissions to warrant a departure of the MRP range adopted in the 2007 Electricity Retail decision.

F.3 Debt margin

The debt margin represents the cost of debt a company has to pay above the nominal risk free rate. The debt margin is related to current market interest rates on corporate bonds, the maturity of debt, the assumed capital structure and the credit rating.

IPART in the past has based its debt margin estimates on fair yield curve data from CBA Spectrum for investment grade BBB and BBB+ rated Australian corporate bonds with a maturity of up to 10 years by averaging the yield for the twenty days to a date close to the time of its decision.[131] The 10 year maturity benchmark is used because it matches the 10 year Commonwealth bond yield that is used to calculate the nominal risk free rate.

IPART has also previously made an allowance for transaction costs associated with the raising of debt, expressed as an increment to the debt margin. IPART's decision to include this mark up is based on the conclusion that debt raising and debt re-financing costs are costs above the debt margin that businesses incur in competitive markets. For the 2007 Electricity Retail decision as well as the 2006 Bulk Water decision, IPART considered an allowance of 12.5 basis points to be an adequate adjustment for debt raising costs.

131 A fair yield curve is a forecast of the yield curve which can be used to assess whether bonds are over or under priced, or used to price new bond issues

F.3.1 Stakeholders' submissions

Sydney Water has proposed a midpoint debt margin value of 1.22 per cent consistent with IPART's 2005 Metropolitan Water decision methodology of using the fair yield estimate of BBB and BBB+ bonds from CBA Spectrum.[132] This is not consistent with IPART's more recent approach of not only using a range based on fair yields of BBB and BBB+ bonds, but also on actual yields on comparable corporate bonds. As a result, Sydney Water's debt margin parameter is not directly comparable (even after accounting for market updates).

Alinta has submitted that that IPART should reconsider the use of CBA Spectrum service due to a growing body of evidence suggesting that CBA Spectrum data consistently understates the true value of the yield. In doing so, Alinta referred to recent research conducted by Allen Consulting Group for the ESC as well as IPART's previous consideration of research evidence on this issue during its 2005 AGLGN decision.

F.3.2 IPART's analysis

IPART has previously considered the issue of whether the CBA Spectrum underestimates the yields in its 2005 AGLGN review. In its response to IPART's draft decision, AGL doubted the accuracy of the CBA Spectrum service for determining debt spreads for long-term maturities based on research conducted by NERA and Allens Consulting Group (ACG). Relying on this body of evidence, AGL suggested that greater weight should be given to yields on corporate bonds provided by another service provider (Bloomberg) or alternatively, the CBA Spectrum data should be adjusted upwards to account for the underestimation.

In its final decision, IPART rejected AGL's argument by stating that it was satisfied with the yields provided by CBA Spectrum because:

- the model it is based on is widely used in the market
- it generates yields for fairly (efficiently) priced bonds
- there is no credible evidence that it produces consistent under-valuation of any class of bonds.

IPART also did not agree on the use of yields from Bloomberg because yields on BBB and BBB+ rated Australian corporate bonds are infrequently reported by Bloomberg. This would require the yields to be interpolated and there was substantial body of evidence on the term structure of credit spreads that indicated that yields cannot be interpolated.

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[132] The CBASpectrum model is a service provided by the Commonwealth Bank of Australia and is a propriety methodology that generates fair yield curves for different credit ratings and maturities derived from Work by Nelson and Siegel, but with modifications designed specifically for the Australian corporate bond market.

IPART is of the view that the recent paper by ACG does not add any new information to the arguments raised by AGL in the 2005 decision, and therefore proposes to retain the use of CBA Spectrum data as a source for estimating yields.

IPART believes that its current approach in estimating debt margin using a range based on fair yield of BBB and BBB+ bonds and actual yields on comparable corporate bonds captures the uncertainty inherent in estimating yields. IPART's method of using a mixture of fair yields and actual yields in deriving the debt margin is the best available option for minimising the difference between predicted and observed yields for Australian corporate bonds and negates the need to constantly re-consider the theoretical proposition of whether the CBA Spectrum produces statistically biased yield predictions.

IPART has, therefore, decided to estimate the appropriate debt margin range with reference to 20 day average of fair yield estimate on 10 year bonds rated BBB+ to BBB and actual yields on available comparable corporate bonds based on CBA spectrum data. IPART has also decided to include an allowance of 12.5 basis points for debt raising costs in the debt margin.

Using the 20-day average debt margins from the CBA Spectrum for all available BBB and BBB+ corporate bonds with the longest maturity matching the 10 year Commonwealth bond and the BBB and BBB+ fair yield estimates as at 12 December 2007, the debt margin range (using the 'basket' methodology and allowing 12.5 basis points) is as follows:

- Low – 192.28 basis points.
- High – 251.24 basis points.

Decision

39 IPART's decision for the draft determination is to adopt a debt margin range of 1.9 per cent (192.28 basis points) to 2.5 per cent (251.24 basis points) based on market observations as at 13 December 2007.

F.4 Capital structure, tax rate and dividend imputation factor

Decision

40 IPART's decision for the draft determination is to adopt the following parameters for the purpose of calculating an appropriate rate of return to apply for Sydney Water:

- debt to total assets of 60 per cent
- tax rate of 30 per cent (statutory tax rate)
- dividend imputation factor of 0.50 to 0.30.

When determining the level of gearing used to calculate WACC, IPART adopts a benchmark capital structure, rather than the actual financial structure, to ensure that customers will not bear the cost associated with an inefficient financing structure.

Another factor that needs to be considered is the dividend imputation factor (gamma). Under the Australian dividend imputation system, investors receive a tax credit (franking credit) for the company tax they have paid. This ensures that the investor is not taxed twice on their investment returns (ie, once at the company level and once on the personal tax level).

The value of the imputation tax credits is represented in the CAPM by 'gamma'. The rationale behind this, including the value of gamma in the CAPM, is that is investors are receiving a tax credit from their investment, they would accept an investment with a lower return than if there were no tax credits attached to this investment. The gamma is an important input in the CAPM, as a high value (for example one) would reduce the cost of capital considerably.

Sydney Water has proposed a debt to total assets value of 60 per cent, the tax rate value of 30 per cent and the dividend imputation factor midpoint value of 0.4.

As Table F.1 shows, IPART's preference for debt to total assets and tax rate parameters have been the benchmark capital structure value and use the prevailing company statutory tax rate. In establishing what gamma value to assign, IPART over the years has reviewed a number of independent expert reports and academic studies that have consistently showed that there is no conclusive market evidence on the exact value that investors attach to imputation tax credits. IPART has therefore maintained the range of 0.5 to 0.3 rather than a point estimate to account for the uncertainty in estimating this value.

IPART believes that there is no new information in the submissions that warrant a change from its previous decisions on the capital structure, tax rate and dividend imputation factor.

F.5 Equity beta

Decision

41 IPART's decision for the draft determination is to adopt an equity beta of 0.80 to 1.0 for the purpose of calculating the rate of return to apply for Sydney Water.

The equity beta value is a business specific parameter that measures the extent to which the return of a security varies in line with the return of the market. It represents the systematic or market-wide risk of an asset that cannot be avoided by holding the assets as part of a diversified portfolio. It is important to note that the equity beta does not take into account business specific or unsystematic risks.

In its submission Sydney Water argues that its equity beta should be the same as that used for electricity network businesses due to increased revenue risk. Consequently, they submit that instead of using IPART's previous range of 0.8 to 1.0, on this occasion they should be allowed the unity value of 1.0.

In proposing a higher equity beta, Sydney Water argues that it faces higher levels of systematic risk than other network utilities because of greater revenue risk and earnings volatility due to:

- the method of regulation and its pricing structure; and
- the increasing level of uncertainty surrounding their water demand associated with water restrictions in Sydney.

Sydney Water also argues that these risks amplify its exposure to systematic risks should therefore be acknowledged and reflected in a higher beta or at least in a beta value equivalent to that allowed to the electricity network businesses.

On balance, IPART is of the view that there is no credible evidence that Sydney Water's systematic risk profile warrants a different equity beta than that used for the Metropolitan Water businesses in the 2005 Determination. It is well accepted that the CAPM theory prescribes that investors should only be compensated for taking on market wide risks. IPART's view is that Sydney Water's revenue and demand risk is a business specific risk and as such it should not be compensated for through a risk premium for additional revenue volatility in its rate of return based on the CAPM.

IPART recognises that if Sydney Water's revenue risk and risks from water restrictions are systematic in nature, it may potentially face a higher risk. IPART notes, however, that it is common market practice to increase or decrease the parameter and rate of return respectively to account for business specific risks. An equity beta range of 0.80 to 1.0 is already conservative to the benefit of Sydney Water and any uncertainty in its true risk profile has been reflected in the use of a range rather than a point estimate. This range balances the interest of investors and customers by accepting that the equity beta may well be in line with the market average (an equity beta of 1.0), while ensuring that there is no significant change in the revenue requirement of water businesses and consequently prices, due to an increase in the cost of capital (equity beta of 0.8).

Another argument for retaining the equity beta used in the 2005 Determination is that IPART's role is to use the best available methodology to ensure a consistent regulatory approach, and in doing so, it is not always possible to get the perfect balance between theoretical requirements and market observations.

F.6 Nominal and real risk free rates and inflation

The risk free rates are used as reference points in determining both return on equity and cost of debt within the WACC. In both the CAPM and cost of debt calculation, the risk free rate is the base to which is added a premium or margin (the debt margin) reflecting the riskiness of the specific business for which the rate of return is being derived.

IPART derives an estimate of the nominal risk free rate from a 20 day average of the yields on the 10 year nominal government bonds. Theoretically, the nearest

approximation of the risk free rate for a lifelong asset should match the length of that asset. IPART therefore uses the 10 year bonds as a proxy in setting 3-5 year price determinations. IPART's source of government bond yields for the nominal risk free rate is the 10-year Commonwealth Government Bond Rate Index calculated by Lewis Securities and published daily in the Australian Financial Review.[133] A similar approach has been adopted by almost all regulators in past decisions. This methodology is also consistent with common market practice.

The use of a pre-tax real WACC necessities the use of a real risk free interest rate. To be consistent with the use of the 10-year government bonds, IPART uses the 20 day average of the yield on inflation indexed government bonds, with the closest maturity to the 10 year government bonds, to derive the real risk free rate. IPART's source of bond yields for the real risk free rate are yields of Treasury Capital Indexed Bonds taken from the Reserve Bank's Daily Statistical Release of Indicative Mid Rates of Selected Commonwealth Government Securities as reported in the Australian Financial Review. A similar approach has been adopted by almost all regulators in past decisions. This methodology is also consistent with common market practice.

IPART has in the past used the Financial Market estimate of expected Inflation by calculating the difference between the 10-year Commonwealth Government Bond Rate Index (nominal risk free rate) and the Treasury Indexed Bond yield (real risk free rate) using the Fisher equation.

In principle, the differential should reflect full information available, including the various economic forecasts of inflation implicit in the bond rate difference. Financial market estimates avoid the use of one or a number of economist's forecasts and has in the past been considered by IPART to be more objective. IPART noted that this method is generally used by market practitioners.

F.6.1 Stakeholders' submission

Sydney Water has proposed a nominal risk free rate of 5.95 per cent and a real risk free rate of 2.87 per cent. Both these parameters have been measured according to IPART's past assumptions on market observed values, except that Sydney Water has upwardly adjusted each value by 20 basis points. Adjusting for latest market observations (as at 13 December 2007), Sydney Water's proposed nominal and real risk free rates stands at 6.01 per cent and 2.87 per cent respectively.

Sydney Water and Alinta have cited recent empirical work by NERA that claims there is both an absolute and relative downward bias in yields on both real and nominal government bonds. Relying on the results of the NERA study, both Sydney Water and Alinta claim that the observed yields on both types of government bonds can no longer be solely relied upon to estimate the both nominal and real risk-free rate, and therefore to derive a forecast inflation.

[133] The indicator is provided by Lewis Securities, which is a respected and widely-used Australian distributor of fixed interest information.

IPART notes that the Essential Services Commission of Victoria (ESC) has recently reviewed its use of the government bonds as risk free rates and subsequent Fisher equation methodology of deriving inflation forecast for the 2008-2012 Gas Access Arrangements review based on concerns expressed by stakeholders relying on NERA's research. The ESC obtained advice on the potential relative bias in implied returns on government bonds from the Allen Consulting Group (ACG), which reviewed the NERA paper.

F.6.2 IPART's analysis

IPART believes that NERA's proposal is not empirically established for regulators and finance practitioners to depart from the well established methodology for determining risk free rates and forecasting inflation from observed yields on government bonds. Any deviation from past methodology must be carefully evaluated given that determining an appropriate rate of return for regulated entities is already an artificial construct that attempts to approximate market outcomes.

In addition to the significant issues highlighted by ACG with NERA's analysis, IPART does not believe the alleged bias in the government bond yields can be considered in isolation. As NERA's findings are only recent, it is yet to undergo a more robust academic analysis before support for NERA's proposal.

Even if NERA's conclusions are found to have some merit, the Australian Energy Regulator (AER) has highlighted that there are still other important empirical considerations that are yet to be fully explored, such as:

- Whether demand/supply imbalances in the Commonwealth Government Securities (CGS) are the only reason for the relative differences between indexed and nominal yields. For example, do other characteristics of the corporate bond market, such as credit risk and industry perceptions, influence investor preference and therefore affect the findings.
- Whether corporate bond comparisons used in the analysis are appropriate without further scrutiny of associated market structures, given that these bonds operate in thinner markets than CGS.
- Whether sufficient available data is used in the analysis to provide the confidence required to support any adjustments to market observations.
- Whether analysis of the alleged bias is based on a short-term anomaly or will remain stable in the future.[134]

These are just some of the issues that require more consideration. Given the lack of certainty surrounding the empirical evidence at this stage, IPART believes that it should retain the use of government bond yields for measuring risk free rates without making any adjustments for 'biases' in their yields. On this basis, IPART proposes to retain its existing approach in determining expected inflation through

[134] AER, Powerlink Queensland Transmission Network Revenue Cap 2007/08 to 2011/12, 14 June 2007.

the Financial Market estimate by calculating the difference between the 10-year Commonwealth government bond rate index and the Treasury indexed bond yield using the Fisher equation.[135]

In IPART's view, despite the lack of depth in the indexed bond rate market, it is still preferable to use the difference between the nominal and real risk free rates as a measure as of long term inflation for the following reasons:

- capital markets value capital flows better than the Commonwealth/State Treasury or the RBA, as the latter two are governed by the political environment at the time of forecasting
- one of the roles of capital markets is to value cash flows (as well as credit risk, liquidity etc)
- individual economist forecasts (or even an average of economist forecasts) may be influenced or biased in favour of the strategy of the institution they are originating from and/or may not be a long term view (frequently economists only look out 2 years)
- selecting which forecast to use or how to 'average' those forecasts would be subjective, lack transparency and accuracy, and
- the use of the latest government bond market based data is objective, transparent and avoids the need for assumptions regarding future inflation. The inflation forecast derived from the Fisher equation also maintains consistency with other financial parameters used in the regulatory framework.

IPART proposes to continue to estimate the appropriate nominal risk free rate using the 20 day average yield on the 10 year Commonwealth Government Bond Rate Index without any upward adjustment for bias in yields. It also proposes to derive the long term inflation forecast by using use the difference between the nominal and real risk free rates, with the real risk free rate being measured as the 20 day average yield in Treasury indexed bonds without any upward adjustment for bias in yields.

Decision

42 IPART's decision for the draft determination is to the following parameters for the purpose of calculating the rate of return to apply for Sydney Water:

- a nominal risk free rate of 6.0 per cent based on 20 day average as at 13 December 2007
- a real risk free rate of 2.8 per cent based on 20 day average as at 13 December 2007
- an inflation of 3.1 per cent as at 13 December 2007.

[135] The Fischer equation states, (1+Nominal Return) = (1+Real return)*(1+inflation).

G Price increases necessary to replicate water restrictions

Members of IPART's Secretariat modelled the price increase required to replicate the demand reduction achieved with water restrictions.[136] Three scenarios were modelled:

- Where a single water usage price (scarcity price) applies to all residential consumption.[137]
- Where a basic entitlement of water is charged at the current Tier 1 price and a scarcity usage price (Tier 2 price) applies to residential consumption in excess of this allowance.
- Where a single water usage price (scarcity price) applies to all consumption (ie, residential and non-residential).

Table G.1 presents the results of the analysis if price increases apply only to **residential consumption**. Three different estimates of the price elasticity of demand (PED) are assumed:[138]

- A demand elasticity of -0.3. This estimate is based on a survey of PED studies conducted by IPART in 2003[139] and particularly studies of locations with broadly similar conditions to Sydney (ie, high rainfall variability, multi-year water storage and exposure to extended droughts). An estimate at the upper end of the range was selected.
- A demand elasticity of -0.17. This is the PED estimated by Grafton and Ward (2007) for the purposes of a study of the welfare costs of mandatory water restrictions in Sydney.[140]

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136 IPART staff working paper, *Water scarcity: Does it exist and can price help solve the problem?* January 2008, pp 13-15, available from: www.ipart.nsw.gov.au.

137 Non-residential consumption is charged at the current Tier 1 price.

138 The price elasticity of demand measures the percentage change in quantity demanded for a given percentage change in price. Where a small change in price results in a large change in the quantity demanded (ie, a PED of greater than 1 in absolute terms), demand is said to be elastic. Where a small change in price has little or no impact on the quantity demanded (ie, a PED of less than 1 in absolute terms) demand is said to be inelastic.

139 IPART, *Investigation into Price Structures to Reduce the Demand for Water in the Sydney Basin - Issues Paper*, December 2003, pp 15-18.

140 Grafton, R.Q. and Ward, M., *Prices versus Rationing: Marshallian Surplus and Mandatory Water Restrictions*, October 2007, p 7.

- A demand elasticity of -0.13. This is based on a study conducted by Warner (1996). Warner used two models for the purposes of estimating the demand for water in the Sydney region, with similar results. He found that the PED for water in Sydney was -0.1266 under the first model, and -0.1242 under the second.[141]

Table G.1 Residential water usage price increases necessary to replicate residential water restrictions

	Demand reduction (% of residential demand) [a]	Price elasticity of demand (PED)	Price increase (P_0 = $1.34)					
			No entitlement		Entitlement = 155 litres/day [b]		Entitlement = 220 litres/day [c]	
Voluntary restrictions	2%	-0.3	7%	($1.43)	17%	($1.57)	52%	($2.04)
		-0.17	12%	($1.50)	31%	($1.76)	92%	($2.57)
		-0.13	16%	($1.55)	40%	($1.88)	120%	($2.95)
Level 1 restrictions	10 %	-0.3	35%	($1.81)	90%	($2.55)	269%	($4.94)
		-0.17	61%	($2.16)	159%	($3.47)	475%	($7.71)
		-0.13	80%	($2.41)	208%	($4.13)	622%	($9.67)
Level 2 restrictions	15%	-0.3	50%	($2.01)	130%	($3.08)	390%	($6.57)
		-0.17	89%	($2.53)	230%	($4.42)	688%	($10.56)
		-0.13	116%	($2.89)	301%	($5.37)	899%	($13.39)
Level 3 restrictions	19%	-0.3	62%	($2.17)	160%	($3.48)	478%	($7.75)
		-0.17	109%	($2.80)	282%	($5.12)	844%	($12.65)
		-0.13	143%	($3.26)	369%	($6.28)	1104%	($16.13)

a Assumes the entire residential demand reduction achieved since the introduction of water restrictions is due to those water restrictions. Demand reductions were calculated using the year ending 30 June 2001 as a base year.

b Entitlement based on a Sydney Water estimate of the consumption of a typical water efficient household with 3 occupants, during water restrictions. Specified on a per occupant basis (ie, 465 litres/3).

c Entitlement based on the current Tier 1 allocation of 100kL/ quarter (1100 litres/day) which was set to meet the non-discretionary needs of a 5 occupant household. Specified on a per occupant basis (ie, 1100 litres/5).

The analysis shows that:

- The higher the target demand reduction, the greater the required price increase. For instance, assuming the PED is -0.3 and the allowance is set at 155 litres, the price would need to increase by 90 per cent to replicate level 1 restrictions (ie, to achieve a 10 per cent demand reduction) and 160 per cent to replicate level 3 restrictions (ie, to achieve 19 per cent demand reduction).
- The higher the water allowance, the greater the required price increase. For instance, in order to replicate level 3 restrictions (ie, to achieve a 19 per cent demand reduction) and assuming a PED of -0.13, an allowance of 155 litres would require a 369 per cent increase in price, while an allowance of 220 litres would require a 1104 per cent increase in price.

[141] Sourced from: IPART, *Investigation into Price Structures to Reduce the Demand for Water in the Sydney Basin - Issues Paper*, December 2003, p 17.

- The more inelastic the demand, the greater the required price increase. The more elastic the demand, the lower the required price increase. For instance, in order to replicate level 3 restrictions (ie, to achieve a 19 per cent demand reduction) and assuming the allowance is set at 220 litres, a PED of -0.3 would require a 478 per cent increase in price, while a PED of -0.13 would require an 1104 per cent increase in price.

Table G.2 presents the results of the analysis if price increases apply to **all residential and non-residential consumption.** It assumes the same residential PEDs as in Table G.1 and a non-residential PED of -0.05.[142] The analysis shows that the price would need to increase by a smaller amount if it applied to all consumption (not just residential consumption).

Table G.2 Residential and non-residential price water usage price increases necessary to replicate residential water restrictions

	Demand reduction (% of residential demand) [a]	Price elasticity of demand (PED): Residential	Price elasticity of demand (PED): Non-Residential	Price increase (P_0 = $1.34) No entitlement	
Voluntary restrictions	2%	-0.3	-0.05	6%	($1.42)
		-0.17		10%	($1.48)
		-0.13		13%	($1.52)
Level 1 restrictions	10%	-0.3	-0.05	32%	($1.77)
		-0.17		54%	($2.06)
		-0.13		68%	($2.25)
Level 2 restrictions	15%	-0.3	-0.05	47%	($1.96)
		-0.17		78%	($2.38)
		-0.13		98%	($2.65)
Level 3 restrictions	19%	-0.3	-0.05	57%	($2.11)
		-0.17		96%	($2.62)
		-0.13		121%	($2.95)

Note: This table represents the price increase necessary to replicate the reduction in residential demand from water restrictions, when the increase in price is applied to all residential and non-residential consumption. Demand reductions were calculated using the year ending 30 June 2001 as a base year.

a Assumes the entire residential demand reduction achieved since the introduction of water restrictions is due to those water restrictions.

142 Commercial and industrial demand for water is a derived demand, ie, it is primarily related to the demand for an end product. As such, it is considered to be more inelastic to changes in price than residential consumption. The elasticity of demand can also be expected to vary more widely in the commercial and industrial sectors, given the heterogeneous nature of demand in those sectors. There are few published papers that separately identify the price elasticity of demand for commercial or industrial users, as such the value of -0.05 is an assumption made for the purposes of modelling in the absence of published data. If the price elasticity of demand were higher for commercial and industrial users (non residential) then the necessary increase in price would be reduced.

H DECC liquid waste levy

Sydney WATER

SW Ref: 003308

RECEIVED
- 5 FEB 2008
INDEPENDENT PRICING & REGULATORY TRIBUNAL

Mr James Cox
Chief Executive Officer and Full-Time Member
Independent Pricing and Review Tribunal of NSW
Level 8, 1 Market Street
SYDNEY NSW 2000

Dear Mr Cox

At the public hearing for Sydney Water's price determination, the Waste Contractors and Recyclers Association of NSW raised the Liquid Waste levy recently introduced by the Department of Environment and Climate Change (DECC). I undertook to provide Sydney Water's views on the issues raised.

I note that the Waste Contractors and Recyclers Association of NSW also made a submission to the Tribunal. Specifically, the submission proposes that Sydney Water increases trade waste charges by an equivalent amount to the $4 million that DECC expects to collect annually through the levy.

The intent of the Liquid Waste levy is to reduce the generation of potentially dangerous liquid wastes. It is also to provide an economic driver to increase the recovery of the reusable components of trackable liquid waste. Applying the levy indirectly to all Sydney Water's trade waste customers would be inequitable and would undermine the purpose of the levy.

Sydney Water has 17,000 trade waste customers. Importantly, most trackable wastes subject to the levy cannot be discharged to Sydney Water's sewer system. As a result, Sydney Water does not collect information about the volume or concentration of trackable liquid waste. We estimate that some 3,200 trade waste customers that generate trackable liquid waste may be subject to the DECC levy. However, 2,400 of these customers predominantly generate 'oily waste' which is subject to an exemption from the levy as it is a recoverable product. The levy also impacts three Sydney Water customers that operate liquid waste facilities. The DECC levy therefore applies to less than 20 per cent of our trade waste customers.

Notably, the levy applies to all liquid waste generators across the State, whether they discharge to sewer or not. Recovery of the levy as proposed would disproportionately disadvantage trade waste dischargers in the Sydney area. As well, it is unreasonable to impose this levy on all trade waste businesses connected to Sydney Water's sewer systems.

Winner of 2006 Stockholm INDUSTRY WATER AWARD

Sydney Water Corporation ABN 49 776 225 038
115 - 123 Bathurst Street Sydney NSW 2000 Australia PO Box 53 Sydney South NSW 1235 Australia
Tel 13 20 92 Fax (02) 9350 4466 DX 14 Sydney www.sydneywater.com.au

The Tribunal has asked if, as a result of the DECC levy, Sydney Water intends to revise the proposed trade waste charges in our pricing submission.

Trade waste charges are paid by businesses within Sydney to discharge trade wastewater to sewer. The charges cover the cost of managing, transporting and treating trade wastewater. They are unrelated to liquid waste generation and disposal as tracked by DECC. I therefore do not propose any changes to our pricing submission in respect to trade waste charges.

Yours sincerely

Kerry Schott
Managing Director

30.1.08

I Asset valuation and Sydney Water's financial position

I.1 Introduction

Along with many other public sector utilities, Sydney Water must report on its performance to a number of regulators. The Auditor General of NSW has responsibility for performing an annual financial audit that provides an independent opinion on Sydney Water's financial reports. It identifies whether Sydney Water complies with accounting standards and relevant laws, regulations and government directions. IPART has responsibility for determining the maximum charges that Sydney Water can levy on its customers and also monitors Sydney Water's compliance with its Operating Licence. The Operating Licence sets standards of performance for service quality and reliability of supply.

The private sector mainly relies on historic cost valuations. An issue has arisen over the valuation methods used by IPART compared to those adopted by Sydney Water. There are a variety of ways of estimating the value of assets and the asset valuation methods adopted by regulators can differ. Performance reporting by water utilities relies on financial accounting reports which are governed by accounting standards. Broadly speaking, valuations can be based on historic cost, inflation adjusted cost or on a replacement value regimen. Pricing regulators need valuation data to determine prices. They rely on calculations based on the investment made by shareholders in the business. IPART uses the valuations to calculate the return on capital invested and the return of capital invested (or depreciation) by shareholders in regulated utilities. These two components can account for a large percentage of the revenue required by the regulated entity to run its business successfully.

Being a public service entity, Sydney Water must follow mandates issued by NSW Treasury. In 1990 NSW Treasury issued guidelines for the adoption of depreciated current replacement cost as a method of valuing assets held by public sector agencies. Treasury believed that this would improve public sector accounting which had relied on historic cost valuation up until that time. SWC began revaluing some of its assets on the new basis in the 1989/90 year and asset values increased significantly.

In the Auditor-General's 1990 report to the NSW parliament the Auditor-General commented that the revaluation of the infrastructure assets had led to a:

> Flow on effect of additional depreciation charges…… This effect is displayed in increased costs and depressed operating results in the Income and Expenditure Statements…..My concerns in this area are that costs will be overstated, that increased prices will be more easily justified, and that depreciation charges will in time exceed the original cost. (Auditor-General, NSW, 1990, p13).[143]

For financial reporting requirements, the Auditor-General of NSW audits Sydney Water's Annual Report under Australian Accounting Standards, including those standards that are Australian equivalents to International Financial Reporting Standards (AEIFRS)[144]. Australian Accounting Standards[145] require Sydney Water to value its system assets initially at 'fair value' and then test for 'impairment' to determine their recoverable amount or value in use. The 'book' or 'carrying' value of assets cannot be in excess of their recoverable amount. Due to the specialised nature of SWC's system assets, their fair value is determined as Sydney Water's estimate of their depreciated current replacement cost which is calculated as the Modern Engineering Equivalent Replacement Value (MEERA). The recoverable amount is calculated by Sydney Water as the discounted future net cash flows the assets are expected to generate over their remaining lives. Generally speaking, Sydney Water adopts system asset values that are the lower of the MEERA and recoverable amount values.

As an economic regulator, IPART requires Sydney Water to provide information so that it can determine the maximum prices that Sydney Water can levy on its customers and so that it can fulfil the requirements of section 15 of the IPART Act. Section 15 lists a number of items that IPART must have regard to when determining prices. These include the impact on customers and the impact on the financial viability of the regulated entity. For its 2000 determination of Sydney Water prices, IPART adopted a "line-in-the-sand" approach to asset valuation in which a distinction is made between past and new investments. The line-in-the-sand approach takes a financial capital view of asset valuation. IPART chose the 1998/99 year as the base year for calculations because this year was considered to be a 'normal' year without any extraordinary items that could distort the valuation process.

The opening asset value for existing assets was established (termed the Regulatory Asset Base or RAB) based on the net present value of future cash flows at price levels current at that time. This calculation is similar to the recoverable amount calculation. After the initial line-in-the-sand calculation, IPART has 'rolled forward' each previous year's RAB value to establish the opening RAB value for the successive year. The RAB roll forward takes account of renewals of existing assets and new

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143 Walker R, Clarke F and Dean G, *Use of CCA in the Public Sector: Lessons from Australia's experience with public utilities*, p 13.

144 Introduced as a requirement in Australia on 1 July 2005.

145 See Australian Accounting Standards AASB 116 – Property, Plant and Equipment, and AASB 136 – Impairment of Assets.

capital expenditure ie prudent capital expenditure is added to the RAB at current cost.

As part of its MEERA methodology, Sydney Water includes the value of both cash and non-cash capital contributions in its estimate of asset base value. IPART excludes any assets from the RAB that have been donated to Sydney Water by land developers (sometimes called contributed assets) or have been funded by developers in the form of cash contributions. IPART believes that including these amounts would mean that ordinary customers would be charged a rate of return on assets which had already been paid for (including a profit component) by new entrants to the system in the purchase price of their land. However, IPART accepts that when the water utility eventually replaces these externally funded assets at the water supplier's own expense, then the cost should be included in the cost of service provision. The cost of replacing assets initially constructed or purchased by a developer are therefore included in the RAB when they are replaced.

I.1.1 Issues raised by the Auditor-General of NSW

In recent reports to the NSW parliament, the Auditor-General has expressed concern over Sydney Water's ability in the future to fund the replacement of its system assets[146]. In the 2006 report, the Auditor-General commented that he believed this issue arises because of the difference between Sydney Water's replacement asset values and values derived from the assets' recoverable amounts. The Auditor-General commented[147]:

> We believe that the gap between Sydney Water's 'replacement' asset values and their cash generating capability is significant and needs further analysis by key stakeholders.

The Auditor-General reported that at 30 June 2006, Sydney Water estimated that it would cost $21.7 billion to replace its assets using the MEERA asset valuation methodology. Conversely, the recoverable amount of the assets was $10.0 billion. The Auditor-General was concerned that Sydney Water will not be able to fund the replacement of its assets at their replacement cost when they reach the end of their useful lives. He believed that this means Sydney Water will have to write down the value of new assets as they are completed because the cost of the assets will be greater than the cash inflows they will generate over their lives.

The Auditor-General also had concerns over Sydney Water's ability to pay dividends to its shareholders (the NSW Government). He reported that, consistent with Australian Accounting Standards, Sydney Water uses its weighted average cost of capital (WACC) to discount the cash flows. However, this rate is significantly higher than the return Sydney Water actually makes on its assets. This creates problems for Sydney Water to achieve a commercial rate of return.

146 Auditor-General of NSW, *Auditor General's Report to Parliament 2006*, p 178.
147 Auditor-General of NSW, *Auditor-General's Report to Parliament 2006*, p 179.

From an accounting perspective, when the book value of assets increases because of a revaluation, the increase flows into an Asset Revaluation Reserve. Decreases in valuation can show as expenses in the Income Statement unless they reverse previous revaluation increases of assets in the Asset Revaluation Reserve. In this case they are offset in the Reserve against the previous increases. Decreases in Sydney Water's book value of assets in recent years have contributed to a reduction in the Reserve's value. The Auditor-General was concerned that if this trend continued, then the Reserve will be exhausted and the decreases will show as expenses in the Income Statement. This will reduce profit and Sydney Water's ability to pay dividends.

The Auditor-General reported that while IPART had granted real price rises in recent determinations, these would not enable Sydney Water to bridge the gap between the recoverable amount of its assets and the cost of replacing them.

In the Auditor-General's 2007 report[148], the issue of replacement of system assets was repeated. He commented that the gap between MEERA values ($22.3 billion) and the recoverable amount ($11.2 billion) was significant. He commented that SWC has sought increased prices in its submission to IPART's 2008 review of charges to improve its financial viability and to bridge the gap between the two asset valuations. SWC also requested a seven per cent real rate of return and shorter asset lives. The Auditor-General also points out that SWC's ability to pay dividends is dependent on profits being available for distribution and access to loan funds.

I.1.2 Issues raised by Sydney Water

In its pricing submission to IPART, Sydney Water has proposed some significant price increases that it believes are needed to secure, among other things, its long term financial sustainability in a time of increasing capital investment. Among a number of issues listed are some that it believes are a consequence of asset valuation methodologies.

Sydney Water is concerned with the deterioration in its balance sheet[149]. Since 2002/03 asset values have been written down to their recoverable amount and the asset revaluation reserve has been decreasing. Depreciation expenses have been trending down as the result of continuing downward revaluations of the asset base, while borrowing costs have been increasing due to the additional debt required to finance increased capital expenditure. A decline in shareholders' funds has been driven by an increase in debt and the declining asset values. Sydney Water comments that prices are not sufficient to support the fair value of the assets because of the difference in IPART's RAB value and Sydney Water's MEERA values. While values increased in 2006/07, the improvement is not sufficient to address the underlying financial sustainability issue.

148 Auditor-General of NSW, *Auditor General's Report to Parliament 2007*, p 158.
149 Sydney Water Corporation submission to IPART Review of Prices, p 6.

In contrast, Sydney Water has made a somewhat contradictory claim in its recent submission to IPART's review of developer charges. In that submission Sydney Water proposes[150] that, for the purpose of determining developer charges, assets not be revalued on a MEERA basis because revaluations in the past have overstated the actual efficient costs incurred by Sydney Water. This comment by Sydney Water raises a number of issues. If Sydney Water continues to use a MEERA approach to value assets but assesses the value of services to developers on some other basis the gap between the RAB and MEERA values is likely to grow still further.

Moreover, if MEERA values are not an efficient cost estimate for determining developer charges what confidence can there be that they represent an efficient basis for assessing the cost of any service.

I.2 Asset values and pricing – some principles

The use of an asset value to aid in determining appropriate price levels for water and related services is a means to an end. That end is the calculation of an economically efficient price that reflects the underlying costs of service provision.

For most goods and services prices are determined by markets and the operation of the rules of supply and demand.

The water industry is something of an exception. In most cases water is a monopoly product which is not freely traded. In the absence of market based prices, notions of cost are used to seek to derive an efficient pricing outcome.

The search for a satisfactory proxy to mimic likely market outcomes in the absence of those markets has given rise to the use of asset valuation methodologies as a means of capturing the underlying economic value of the infrastructure supplying services. However, these proxies are not without their own difficulties.

In any discussion dealing with cost based pricing it is important to understand the concept of economic income as it is this income that becomes important in any evaluation of the success or failure of whether costs are being just recovered, under recovered or over recovered.

Economic income is defined as the net cash receipts generated from an investment in any period plus the change in the value of the investment during the period. This, in effect, recognises as income net cash received plus unrealised capital gains.

Economic Income = Net Cash Flows + Change in Asset Values[151].

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150 Sydney Water Corporation submission to IPART Review of Developer Charges, p 27.

151 For the purpose of measuring performance the measurement of the Economic Rate of Return is defined as:

$$ERR = \frac{\text{Net Cash flows + Change in Asset Value}}{\text{Asset Value}}$$

A normal commercial business makes its investment decisions based on its estimates of future demands for services and the prices those services are likely to command. A potential investment will be deemed worthwhile where the following condition is satisfied.

$$\Sigma PV \text{ (Selling Price x Quantity Sold} - \text{Capital Expenditure} - \text{Operating Cost)} \geq 0$$

at the hurdle investment or discount rate.

In a competitive market any super normal profits would be competed away to a point where:

$$\Sigma PV \text{ (Selling Price x Quantity Sold} - \text{Capital Expenditure} - \text{Operating Cost)} = 0$$

meaning that only a normal profit will be earned.

Rearranging the above yields:

$$\Sigma PV(\text{Selling Price x Quantity Sold}) = \Sigma PV(\text{Capital Expenditure} + \text{Operating Cost})$$

and

$$\text{Selling Price} = \frac{\Sigma PV \text{ (Capital Expenditure + Operating Cost)}}{\Sigma PV \text{ Quantity Sold}}$$

I.2.1 Asset Valuation Methodologies

The water industry has long been pursuing the objective of setting prices that fully recover efficient costs. Indeed the Council of Australian Governments' (COAG) endorsed National Water Initiative contains a requirement that water prices progressively move towards full cost recovery. In order to do this there is a need to establish values of assets that reflect full cost. The challenge is to assign a value to assets that reflects their value in order to accord with the NWI principles of full-cost recovery and pricing transparency.

There are a range of different approaches to asset valuation that can be adopted that met the definition of full cost recovery.

The various asset valuation methodologies include:

- Historic cost.
- Indexed historic cost (current cost or current purchasing power).
- Replacement cost.
- Optimised replacement cost.
- Deprival value.
- Optimised deprival value.
- Economic valuation.

It is also useful to consider these in the context of Australian Accounting Standards as these shape the information that water utilities already collect and which are to greater or lesser extents the subject of audit or other verification processes.

Examples of a number of the approaches are set out in section 2.3 Income Determination, Capital Gains and the Weighted Average Cost of Capital.

Historic Cost

The historical cost approach uses the acquisition or "book value" of an asset. This information is usually simply available and can be easily verified as part of normal audit processes of accounting transactions.

The Australian Accounting Standard AASB 116 specifies that:[152]

> The cost of an item of property, plant and equipment shall be recognised as an asset if and only if:
>
> a) It is probable that future economic benefits associated with the item will flow to the entity; and
>
> b) The cost of the item can be measured reliably.

AASB 116 also provides agencies with two approaches to valuing assets after initial recognition. One of these approaches provides[153]:

> After recognition as an asset, an item of property, plant and equipment shall be carried at its cost less any accumulated depreciation and any accumulated impairment losses.

In effect this means ongoing valuation on the basis of depreciated historic costs. This is the most usual valuation method used by commercial corporations, with the possible exception of land and buildings. Privately owned and some government owned utilities also use this method of asset valuation.

It is sometimes argued that that while historic cost has the advantages of transparency, verifiability and auditability, it may not give appropriate incentives to investors. The argument runs that it can encourage gold plating or over investment in capacity. However, it is not clear whether this criticism is any more valid for the historic cost valuation approach compared with other valuation methods.

A more valid criticism relates to the likelihood that asset values will bear little or no relationship to the opportunity cost of the asset. This is likely to be particularly so in the utilities industry where asset lives tend to be long.

The use of historic cost has implications for the discount rate or WACC that would be used in determining the rate of return a water utility would need to earn to justify an investment or to estimate the income entitlement. In this case a nominal pre-tax rate of return would be appropriate. Provided a nominal pre-tax rate of return is used

[152] AASB 116, Clause 7.
[153] AASB 116, Clause 30.

the historical cost approach will ensure that capital expenditure costs are fully recovered over the expected lives of assets.

The use of historical cost values of assets for the purpose of determining prices can also have implications for inter generational equity. This tends to be the major criticism of the approach. Water and other network service assets are generally sized so that they will accommodate the requirements of existing customers plus an allowance for growth in demand and the entry of new customers. This approach is adopted because it is the most cost effective way of providing services to all customers. In effect, the utilisation of the asset can be thought of as a "club good" where all users and potential users are dependent on each other in order to benefit from the lowest possible cost.

The use of historic cost asset valuations will normally see a later entrant being called upon to pay a price that is less, in real terms, than the initial cohort of users. Some might argue that it is unfair or inequitable for prices to benefit late comers and that all should pay the same price in real terms.

However, the historical cost approach is straight forward, transparent and easily understood. Apart from the concern mentioned earlier about equity considerations, the approach is unlikely to generate perverse outcomes.

Indexed or Inflation Adjusted Historic Cost (Current Purchasing Power)

One mechanism for overcoming the shortcomings of the historic cost valuation method is to adapt the method to include adjustment for inflation by indexing the historic cost of an asset by the movement in the CPI or a similar cost index. The depreciation is similarly adjusted to reflect changes in the index.

This approach when coupled with the use of an independently derived and well regarded index retains the advantages of simplicity and transparency of the historic cost method of asset valuation while at the same time introducing a proxy to seek to overcome the criticism of lack of reflectivity with the contemporary cost of the asset.

This valuation approach is used by IPART for water and electricity distribution network service providers (DNSPs). From a regulator perspective this approach is easy to administer and tends to avoid 'gaming' that can be a feature of the revaluation of long lived assets. It also avoids related issues that can arise with the treatment of capital gains and losses that might arise as a result of revaluations.

The use of inflation adjusted historic cost gives rise to what is termed a regulatory asset base that is used by pricing regulators for pricing purposes.[154] This asset base is

[154] The experiences with privatisation in the UK and particularly the fact that the floatation prices of water companies were significantly less than the current cost of their assets, saw the adoption of Regulatory Asset Bases for a range of industries such as telecoms, gas, water, electricity and airports.

A similar approach involving the use of Regulatory Asset Bases has been adopted in New South Wales, Victoria, South Australia, Western Australia, the Northern Territory, Tasmania, and the ACT.

likely to differ through time from the asset values in the accounting records of a regulated entity estimated in accordance with accounting standards.

In effect the regulatory asset base is a measure of the financial value (actual dollars spent) invested in the business by the owner. t therefore serves the function of maintaining the value of capital intact in real terms. It satisfies the identity of:

$$\Sigma PV \text{ Income} = \Sigma PV \text{ (Operations, Maintenance and Administration + Capital Expenditures)}$$

which each utility seeks to satisfy in order to justify a new investment. The approach therefore satisfies the requirement of full cost recovery.

In relation to the discount rate to be used in the above calculation and the rate of return to be earned on the asset base through time, because the effect of inflation is reflected in the value of the asset base through time a real discount rate is used.

Replacement Cost

It has been mentioned previously that the Australian Accounting Standards provide water agencies with two approaches to valuing assets after initial recognition. One of those approaches is historic cost. The other relates to revalued assets.

Section 31 of AASB 116 provides:

> After recognition as an asset, an item of property, plant and equipment whose fair value can be measured reliably shall be carried at a revalued amount, being its fair value at the date of revaluation less any subsequent accumulated depreciation and subsequent accumulated impairment losses. Revaluations shall be made with sufficient regularity to ensure that the carrying amount does not differ materially from that which would be determined using fair value at the reporting date.

Subsequent provisions discuss how to determine fair value, as follows:

> The fair value of land and buildings is usually determined from market-based evidence by appraisal that is normally undertaken by professionally qualified valuers. The fair value of items of plant and equipment is usually their market value determined by appraisal.[155]
>
> If there is no market-based evidence of fair value because of the specialised nature of the item of property, plant and equipment and the item is rarely sold, except as part of a continuing business, an entity may need to estimate fair value using **an income or a depreciated replacement cost approach**.[156] [emphasis added]

The replacement cost approach seeks to value an asset at the cost of replacing it in its existing form. Some have argued that it overcomes the bias for service providers to gold plate and over capitalise. However, as there has been a need to develop an approach that seeks to optimise the replacement cost value (see next section) the justification for this argument is less than clear.

[155] AASB 116 Clause 32.
[156] AASB 116 Clause 33.

It is also argued that this approach has the affect of placing the risk of technological change or obsolescence on the service provider. Conversely, the service provider would stand to benefit from any escalation in the replacement cost above the rate of inflation.

The use of replacement cost has the advantage of ensuring that assets are valued in a manner consistent with their contemporary values. This can also theoretically mean that consumers gain a benefit where technical change results in decreases in the replacement cost of assets through time. Conversely, where the replacement cost of assets increase in real terms (ie, by greater than the cost of inflation), a capital gain could accrue to the asset owner.

A price regulator will wish to take into account the prospect of any capital gains[157] or losses and adjust prices accordingly so that the following identity is satisfied

ΣPV (Income from sales + Change in asset values)
=
ΣPV (OMA + Depreciation + Replacement Cost x Rate of Return)

Differences of opinion can also arise between water utilities and water regulators over the appropriateness of the valuations arrived at. The Replacement Cost method therefore tends to suffer from a lack of transparency in revaluation processes and consequently lacks wide spread support as a valuation method.

The prospect of technological change can also mean that less than full costs can be recovered on the one hand or over recovered on the other[158].

Optimised Replacement Cost

Optimised Replacement Cost (ORC) is a refinement on pure replacement cost. It seeks to value assets based on the most efficient method of providing the same level of service as being provided by the current pool of assets. The optimisation process does not seek to value assets on the basis of like with like where there is evidence of over capacity or over investment as a result of past poor investment decisions or changes in the underlying demand for a good or service.

While this method seeks to overcome some of the deficiencies of the replacement cost method it does so somewhat imperfectly and at the expense of a lack of transparency, greater complexity and expense, and the need to rely more heavily on judgements and expert advice.

Debates and disputes are likely over the most appropriate alternative asset and even whether there is unplanned excess capacity in the system. The problem for regulators of the treatment of capital gains and losses remains.

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157 The issue of capital gains and losses is discussed more fully in Section 2.3.

158 Where the cost recovery identity is defined as:
ΣPV(Selling Price x Quantity Sold) = ΣPV(Capital Expenditure + Operating Cost)

Depreciated Optimised Replacement Cost (DORC) reflects ORC after adjustment for depreciation. As with ORC there is a high degree of subjectivity in the optimisation process and consequently it suffers from a lack of transparency. A further disadvantage is the large increase in prices (in schemes where the economic value is much lower than the DORC) and the impact of price increases on customers.

The prospect of technological change can also mean that less than full costs can be recovered on the one hand or over recovered on the other.

An often cited advantage of DORC is that the signal to consumers of pricing at a level that reflects a rate of return on the DORC value better reflects the opportunity cost of service provision. However, the concept of opportunity cost carries with it the notion that an asset can be easy converted to cash or has some alternative use. In the case of the water industry, assets are generally water industry specific and cannot easily be put to alternative uses. Where those alternative uses do exist they generally involve using the asset for some lower value use.

Deprival Value

The COAG convened Expert Group on Asset Valuation Methods and Cost Recovery Definitions recommended the adoption of the deprival value methodology for asset valuation. They argued that:

> Not only [is this] consistent with the approach taken to asset valuation by the Steering Committee on National Performance Monitoring of Government Business Enterprises, but regardless of the extent of cost recovery achieved, provides a measure of the real (economic) costs of service provision.[159]

The Steering Committee on National Performance Monitoring of Government Business Enterprises had this to say about the deprival value approach.

> Deprival value of an asset is the value to the entity of the future economic benefits that the entity would forgo if deprived of the asset. Under this approach, assets are valued at the amount that represents the loss that might be expected to be incurred by an entity if that entity was deprived of the service potential or future economic benefits of these services at the reporting date.[160]

The Steering Committee went on to say that:

> Thus the value to an entity in most cases will be measured by the replacement cost of services embodied in the asset, given that deprival value will normally represent the cost avoided as a result of controlling the asset and that replacement cost represents the amount of cash necessary to obtain an equivalent or identical asset.
>
> In applying deprival value concepts, the basic principles are:

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[159] Report of the Expert Group on Asset Valuation Methods and Cost-Recovery Definitions for the Australian Water Industry, February 1995, p 3.

[160] Steering Committee on National Performance Monitoring of Government Trading Enterprises, October 1994 *Overview: Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises,* p 9.

i. Where an entity would replace the service potential embodied in an asset if deprived of it, the asset should be measured at its current cost (i.e. the lowest cost at which the gross service potential of the asset could currently be obtained in the normal course of business). This is the amount which an entity would need to receive in compensation to restore the asset to its former capacity.

ii. Where an entity would not replace an asset if deprived of it, the asset would be measured at the greater of its market value and the present value of future net cash inflows expected from continued use of the asset. This is the amount by which an entity would be worse-off if deprived of the asset.

iii. Where an asset is surplus to requirements, the asset should be measured at its market value.[161]

Recalling the identity that an investment in an asset will only take place where:

$$\Sigma PV(\text{Selling Price} \times \text{Quantity Sold}) \geq \Sigma PV(\text{Capital Expenditure} + \text{Operating Cost})$$

The use of the first valuation option of the use of replacement (or current) cost would only take place where:

$$\Sigma PV(\text{Selling Price} \times \text{Quantity Sold}) \geq \Sigma PV(\text{CC Depreciation} + \text{Written Down Replacement Cost} \times \text{R of R} + \text{Operating Cost})$$

But we have already said that for reasons of economic efficiency, prices should be set such that:

$$\Sigma PV(\text{Selling Price} \times \text{Quantity Sold}) = \Sigma PV(\text{Capital Expenditure} + \text{Operating Cost})$$

Under these rules a water utility would make a decision to replace where:

$$\Sigma PV(\text{Selling Price} \times \text{Quantity Sold}) = \Sigma PV(\text{CC Depreciation} + \text{Written Down Replacement Cost} \times \text{R of R} + \text{Operating Cost})$$

The rules contained in points (i) and (ii) above yield identical outcomes ie,

$$\Sigma PV(\text{Cash flows}) = \Sigma PV(\text{CC Depreciation} + \text{Written Down Replacement Cost} \times \text{R of R} + \text{Operating Cost})$$

The Deprival Value approach to asset valuation and the associated Optimised Deprival Value approach, while useful for performance monitoring purposes, present problems in application when seeking to use them to calculate prices. Principle amongst these is the circularity problem that arises of attempting to use asset values to determine income where the asset value itself is a function of future incomes.

[161] ibid, p 10.

The implied use of replacement cost valuation in point (i) above can also present the same problems as those associated with a lack of transparency that manifest themselves with replacement cost valuation techniques.

In adopting the approach, a water utility also needs to make decisions about whether the service capacity of an asset would be replaced. Not only is it difficult to make these decisions where replacement may be may years into the future, but a decision on replacement is not independent of the prices received from the services generated by the asset.

Economic Value of Assets

Before concluding this outline on assets valuation methodologies it is also appropriate to consider an economist's approach to asset valuation, particularly given that economists generally have a considerable role to play in setting prices for water services. The Industries Assistance Commission defined the economic value as follows:

> The economic value of an asset is that which would emerge if the asset were traded in a fully competitive market. This will be the value that, taking into account the expected stream of future cash flows and disposal value of the asset, will generate a rate of return to the buyer equal to that earned if the resources were used elsewhere in the economy.[162]

This value is consistent with the Recoverable Amount Test discussed above.

Pricing regulators can also define the stream of future cashflows through their price setting processes. Assuming that operating costs in any year are recovered from users in the year in which they are incurred, the price relating to an asset can be given by:

$$\text{Price} = \frac{PV\ \Sigma\ (\text{Capital Cost})}{PV\ \Sigma\ (\text{Quantity Sold})}$$[163]

Asset Values and the Recoverable Amount Test.

The Accounting Standards place considerable stress on the need to ensure that assets are reflected in an entity's accounts at amounts that are not in excess of their recoverable amounts.

Accounting Standard AASB 136 defines recoverable amount as the higher of fair value of an asset less costs of disposal on the one hand and value in use on the other.

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[162] Industries Assistance Commission, *Government (Non-tax) Charges, Vol 3,* 1989 p 148.

[163] PV(Quantity) reflects the marginal time preference people have for consumption now versus deferring consumption to some time into the future.

Fair value less costs to sell is defined as the amount obtainable from the sale of an asset or cash-generating unit in an arm's length transaction between knowledgeable, willing parties, less the costs of disposal.[164]

Value in use if defined as:

i) The present value of the future cash flows expected to be derived from an asset or cash-generating unit; or

ii) The depreciated replacement cost of the asset when the future economic benefits of an asset of a not-for-profit entity are not primarily dependent on the asset's ability to generate net cash inflows and where the entity would, if deprived of the asset, replace its remaining future economic benefits.[165]

The Accounting Standard further requires that where the recoverable amount is less than the asset's carrying amount, the carrying amount of the asset be reduced to its recoverable amount. This reduction is referred to as an impairment loss.

I.2.2 Other considerations in valuing assets

Establishing a Regulatory Asset Base - the Line-in-the-Sand

The economist's notion that the value of an asset is equivalent to the expected discounted stream of future earnings net of the cost of producing those earnings gave rise to what is now referred to as a 'line-in-the-sand' or start up value of a Regulatory Asset Base used for the purpose of setting a water utility's prices.

Formal price regulation of water utilities' services is a relatively new innovation in Australia with the first state based regulatory regime being established in NSW in 1992. At that time water utilities had been in operation for very many years and in the case of NSW its oldest water utility had been in operation for well over 100 years prior to the establishment of the Independent Pricing and Regulatory Tribunal (IPART). A similar situation applied in Victoria where Melbourne and Metropolitan Board of Works was established in 1891 and the Essential Services Commission in 2002.

Over the period preceding the establishment of price regulation, it is fair to say that a range of considerations influenced various water and sewerage planning decisions. These varied from concerns about public health protection, the desires to foster urban development and growth, improvements in livings standards and later to better environmental management. For a greater part of the twentieth century water and sewerage services were seen as 'public goods' and were paid for by means of property value based rates or taxes.

164 AASB 136, Clause 6, p 15.
165 AASB 136, Clause g, p 7.

In addition, assets of considerable value were acquired by way of grants, subsidies and lump sum contributions such as through levies imposed on land developers. If a water agency requires a land developer to fund or install infrastructure the water agencies net outstanding investment in those assets is effectively zero. As a consequence any return on and of capital would also be zero.

It was only in the latter part of the 20th century that concerns turned to the effects of these charging arrangements on business competitiveness and efficient and effective natural resource management.

For its part IPART in NSW recognised the difficulties inherent in trying to unravel 100 years of history and develop what could be considered a fair charging regime for water services, particularly given that an array of information that might have been useful in the exercise was not longer extant.

Given these circumstances, it was decided to value all existing assets on the basis of their actual income earning potential at a particular point in time. This valuation was made on the assumption that then existing net income being earned from assets would continue into the future. The asset base is generally referred to as a Regulatory Asset Base (RAB) which is used for pricing purposes. This term is used to distinguish it from the asset base of the water utilities used for their accounting and external reporting purposes.

A decision to draw a line in the sand has the advantages of being transparent and simple to administer. The approach also has the advantage of overcoming the potential circularity problem between asset values, income determination and prices inherent in a number of the valuation approaches under consideration. The approach also does not bring with it the problems that can be encountered with successive revaluations.

However, some have argued that:

> The arbitrary exclusion of assets on the grounds that they are sunk fails to provide management with the incentive to enhance shareholder value, and does not provide incentives for the better management of assets or for future investment.

To a large extent these criticisms indicate a lack of understanding of the approach and the industry. Some economists argue that to the extent that an asset is not achieving a price consistent with its cost of production and maintenance the uncovered value is sunk. Others take the view that given that they have no alternative use they are sunk in their entirety. The issue of future investments is another matter entirely and will be dealt with in the section below.

Rolling Forward the Asset Base

In the previous section it was explained that the initial Regulatory Asset Base can be valued on the basis of their actual income earning potential at a particular point in time. It was further explained that this valuation is made on the assumption that existing net income being earned from assets at the time the RAB is established would continue into the future. The present value of this income stream resulted in the commencement regulatory asset value.

The next question that needs to be addressed is the manner in which the RAB is adjusted subsequent to its establishment to reflect changes in the stock of assets subsequent to the initiating date. The answer is relatively simple. In each subsequent year RAB value is indexed for inflation, newly constructed assets are added to the asset base at their efficient cost and depreciation and the value of asset disposals deducted to "roll forward" the asset base for the purpose of establishing a new RAB.

The regulatory contract seeks to ensure that for assets constructed after the initial RAB is determined will receive income sufficient to justify the investment. Prices will be set for each new[166] increment of investment to satisfy the identity:

$$\Sigma PV(\text{Selling Price} \times \text{Quantity Sold}) \geq \Sigma PV(\text{Capital Expenditure} + \text{Operating Cost})$$

There is however, one further adjustment that should be made and that deals with the treatment of contributed and gifted assets and the treatment of cash contributions and subsidies.

Regulatory Asset Base and Contributed Assets

The water industry by virtual of its monopoly position and government ownership has the ability to require new entrants to contribute to the cost of the infrastructure necessary to supply them with water and sewerage services through what are termed developer charges.

In many cases the payment of these contributions is not a matter of choice but rather a condition on the land developer when seeking development approval. Payment of the contribution is also a condition of connecting to the existing water and sewerage systems.

In addition to the ability to require the payment of developer charges water agencies are sometimes the beneficiary of grants and gifts from governments.

The payment of a capital contribution in order to connect to a water and/or sewerage system represents a pre payment of the sums of money that the water agency would have otherwise collected through time for the use of the asset in question. To the extent that the capital cost has been paid in the form of a lump sum entry price, the water agency cannot equitably seek to then have the user also pay a user charge

[166] New in this context relates to each original and replacement asset build after the initial RAB is set.

through time to reflect the return on and of capital which was not outlaid by the water agency in any event.

Looking at it another way. I f the water agency's net outstanding investment in an asset is zero because of the payment of a capital contribution any return of and on that capital balance would also be zero.

Marsden Jacobs and Associates also considered the matter for the Queensland Competition Authority in 1999 when they said:

> There can be little doubt that the gifting of the capital occurs only because the business accepts the obligation to provide services to the new group of customers.
>
> In general, the capital so gifted or paid in exchange for obligations would appear to be for the benefit of customers. This leads to the essential conclusion that gifted capital should be excluded from the regulatory capital base when determining price revenue levels for monopoly suppliers …
>
> The practical conclusion that gifted capital should be excluded from the regulatory capital base can be derived by either of three routes:
>
> - first, if alternatively this capital funding were to be treated as matched against the capital expenditures incurred, then the funding does not contribute to the total shareholder capital of the entity and the issue of a return does not arise;
> - second, if this capital funding is treated as part of the capital of the business, then there needs to be recognition that the governments making the capital grants, are not seeking a return on that capital.
>
>   Similarly, the developers transferring infrastructure do not seek an ongoing return on the capital that they may be seen to have contributed, over and above what they have received through the sale of the serviced land.
> - third, if the gifted capital is seen as a capital sum paid in exchange for accepting the obligation to supply in perpetuity – or at least for the length of the infrastructure's life, then the addition to asset values in the balance sheet is exactly offset by the additional liabilities – and there is no increase in shareholder funds.
>
> The transferred infrastructure carries explicit and ongoing responsibilities and liabilities. It is not infrastructure which can be sold, since it is connecting infrastructure carrying specific and ongoing obligations to the developer and persons subsequently purchasing land from the developer. In addition, there is unlikely to be a secondary market for such infrastructure.[167]

A number of regulatory agencies have considered the issue of contributed assets. The Queensland Competition Authority (QCA) have stated that "capital contributions need to be considered in the context of a pricing framework that promotes rational economic behaviour."[168] The QCA identifies two approaches to dealing with contributed assets involving either:

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[167] Marsden Jacob *"Transferred Infrastructure & Gifted Capital: Consideration in Price Setting for Urban Water Businesses,* for the Queensland Competition Authority, p A3.

[168] ibid, p 38.

- including the contributed assets in the RAB, but employing some form of offsetting mechanism to account for the contribution; or
- excluding the contributed assets from the regulatory asset base for pricing purposes.[169]

The Authority concluded that it preferred to include contributed assets in the regulatory asset base together with some form of offsetting mechanism.

In the case of Western Australia the Economic Regulation Authority treats developer contributions as both revenue in the year in which they are received and as a capital expenditure that is added to the asset base of the regulated business.[170]

In South Australia the approach adopted in relation to contributed assets has varied over time. At its most recent review the SA Government agreed to remove contributed assets from SA Water's regulatory asset base along with the associated depreciation. It was felt that this was consistent with current regulatory practice in other state jurisdictions.[171]

In NSW, IPART offsets developer charges income that is expected to be collected against the Regulatory Asset Base used to calculate the quantum of annual periodic income.

It is understood that contributed assets are removed from the initial asset base for urban water businesses in Tasmania, the ACT and the Northern Territory.[172]

There seems to be a broad consensus that an adjustment should be made to ensure that agencies are not able to earn a return on and of contributed assets which they have not paid for.

I.2.3 Income determination, capital gains and the weighted average cost of capital

Previous discussion in this paper has distinguished between the contribution of net cash flows and changes in asset values in defining economic income. It is appropriate that consideration is now given to the effect of capital gains on the income determination process.

Where an asset value is used to determine a price a systematic escalation of the value of the asset above the change in inflation will give rise to a real capital gain all other things being equal. Where an asset on revaluation is subject to a systematic decrement in real terms, a capital loss will result.

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169 Ibid, p 38.

170 Economic Regulation Authority, *Final Report: Inquiry on Urban Water and Wastewater Pricing,* November 2005, p 75.

171 South Australian Government, *Transparency Statement; Water and Wastewater prices in Metropolitan and Regional South Australia, 2005-06,* pp 28 and 29.

172 NWC, *Stocktake Executive Summary*, p 7.

To enable a discussion on capital gains to be more fully developed it is worth digressing and recalling the manner in which a capital charge would be recovered through time under some of the different types of asset value approaches discussed previously.

In all the examples developed a number of assumptions are made. Where possible and relevant these assumptions are held constant for all the examples developed.

Assumptions.

Capital Expenditure	$5,000,000
Planned Asset Life	25 years
Real Discount Rate	6.5%
Inflation Rate	3.0%
Nominal Discount Rate[173]	9.695%

Table I.1 shows an amortisation schedule for an investment of $5 million over 25 years based on the historic cost method. The important feature to note is that over the life of the asset the present value of the sum of annual depreciation and a rate of return on the outstanding value of the investment equals the amount initially invested. This equality is important to justify the investment on the one hand and to ensure that over recovery is not taking place on the other.

Under the historical cost convention, as the asset value is not indexed or revalued to take account of inflation a nominal discount rate (9.695 per cent) is used.

[173] Calculated as follows: (1 + real discount rate) x (1 + inflation rate) - 1

Table I.1 Historic cost

Capital Expenditure	$5,000,000				
Planned Asset life	25				
Real Discount Rate	6.50%				
Inflation Rate	3.00%				
Nominal Discount Rate	9.695%				
Net Present Value	$1,858,834		$3,141,166	$5,000,000	
Year	**Inflated Historic Cost**	**Depreciation**	**WDRC Year End**	**ROR**	**Total Returns**	**R of R**
1	$5,000,000	$200,000	$4,800,000	$484,750	$684,750	9.7%
2	$4,800,000	$200,000	$4,600,000	$465,360	$665,360	9.7%
3	$4,600,000	$200,000	$4,400,000	$445,970	$645,970	9.7%
4	$4,400,000	$200,000	$4,200,000	$426,580	$626,580	9.7%
5	$4,200,000	$200,000	$4,000,000	$407,190	$607,190	9.7%
6	$4,000,000	$200,000	$3,800,000	$387,800	$587,800	9.7%
7	$3,800,000	$200,000	$3,600,000	$368,410	$568,410	9.7%
8	$3,600,000	$200,000	$3,400,000	$349,020	$549,020	9.7%
9	$3,400,000	$200,000	$3,200,000	$329,630	$529,630	9.7%
10	$3,200,000	$200,000	$3,000,000	$310,240	$510,240	9.7%
11	$3,000,000	$200,000	$2,800,000	$290,850	$490,850	9.7%
12	$2,800,000	$200,000	$2,600,000	$271,460	$471,460	9.7%
13	$2,600,000	$200,000	$2,400,000	$252,070	$452,070	9.7%
14	$2,400,000	$200,000	$2,200,000	$232,680	$432,680	9.7%
15	$2,200,000	$200,000	$2,000,000	$213,290	$413,290	9.7%
16	$2,000,000	$200,000	$1,800,000	$193,900	$393,900	9.7%
17	$1,800,000	$200,000	$1,600,000	$174,510	$374,510	9.7%
18	$1,600,000	$200,000	$1,400,000	$155,120	$355,120	9.7%
19	$1,400,000	$200,000	$1,200,000	$135,730	$335,730	9.7%
20	$1,200,000	$200,000	$1,000,000	$116,340	$316,340	9.7%
21	$1,000,000	$200,000	$800,000	$96,950	$296,950	9.7%
22	$800,000	$200,000	$600,000	$77,560	$277,560	9.7%
23	$600,000	$200,000	$400,000	$58,170	$258,170	9.7%
24	$400,000	$200,000	$200,000	$38,780	$238,780	9.7%
25	$200,000	$200,000	$0	$19,390	$219,390	9.7%
Total		$5,000,000		$6,301,750	$11,301,750	

Table I.2 sets out an amortisation schedule for a similarly valued asset under the inflation adjusted or current cost approach to asset valuation.

Under this approach the residual value of the asset at the end of each year is inflated by the movement in the CPI as also is the value of depreciation. Because the value of the asset is maintained in real terms the rate of return earned in any year on the outstanding asset value is calculated in real terms.

Again the present value of the sum of depreciation (return of capital) and rate of return (return on capital) over the life of the asset equals the initial investment at the nominal discount rate of 9.695 per cent.

Table I.2 Inflation adjusted historic cost (current cost)

Capital Expenditure	$5,000,000			
Planned Asset life	25			
Real Discount Rate	6.50%			
Inflation Rate	3.00%			
Nominal Discount Rate	9.695%			
Net Present Value	$2,439,575	$2,560,425	$5,000,000	

Year	Inflated WDCC	Depreciation	WDCC Year End	ROR	Total Returns	R of R
1	$5,150,000	$206,000	$4,944,000	$334,750	$540,750	6.5%
2	$5,092,320	$212,180	$4,880,140	$331,001	$543,181	6.5%
3	$5,026,544	$218,545	$4,807,999	$326,725	$545,271	6.5%
4	$4,952,239	$225,102	$4,727,137	$321,896	$546,997	6.5%
5	$4,868,951	$231,855	$4,637,096	$316,482	$548,337	6.5%
6	$4,776,209	$238,810	$4,537,399	$310,454	$549,264	6.5%
7	$4,673,521	$245,975	$4,427,546	$303,779	$549,754	6.5%
8	$4,560,372	$253,354	$4,307,018	$296,424	$549,778	6.5%
9	$4,436,229	$260,955	$4,175,274	$288,355	$549,310	6.5%
10	$4,300,532	$268,783	$4,031,749	$279,535	$548,318	6.5%
11	$4,152,702	$276,847	$3,875,855	$269,926	$546,772	6.5%
12	$3,992,130	$285,152	$3,706,978	$259,488	$544,641	6.5%
13	$3,818,188	$293,707	$3,524,481	$248,182	$541,889	6.5%
14	$3,630,215	$302,518	$3,327,697	$235,964	$538,482	6.5%
15	$3,427,528	$311,593	$3,115,935	$222,789	$534,383	6.5%
16	$3,209,413	$320,941	$2,888,472	$208,612	$529,553	6.5%
17	$2,975,126	$330,570	$2,644,556	$193,383	$523,953	6.5%
18	$2,723,893	$340,487	$2,383,406	$177,053	$517,540	6.5%
19	$2,454,908	$350,701	$2,104,207	$159,569	$510,270	6.5%
20	$2,167,333	$361,222	$1,806,111	$140,877	$502,099	6.5%
21	$1,860,295	$372,059	$1,488,236	$120,919	$492,978	6.5%
22	$1,532,883	$383,221	$1,149,662	$99,637	$482,858	6.5%

23	$1,184,152	$394,717	$789,435	$76,970	$471,687	6.5%
24	$813,118	$406,559	$406,559	$52,853	$459,411	6.5%
25	$418,756	$418,756	$0	$27,219	$445,975	6.5%
Total		$7,510,608		$5,602,841	$13,113,450	

An interesting feature of this approach when compared with historic cost is the change in the present value of the relative shares of depreciation (which effectively maintains the capital invested in the business intact) and returns to owners.

Table I.3 sets out the amortisation for an asset with an initial cost of $5 million over 25 years but assumes that the asset is revalued each year and that the asset value increases by 1.5 per cent above the movement in the CPI each year.

Table I.3 WDRC with asset price inflation

Capital Expenditure	$5,000,000					
Planned Asset life	25					
Real Discount Rate	6.50%					
Inflation Rate	3.00%					
Nominal Discount Rate	9.695%					
Capital Gain/(Loss)	1.500%					
NDR[174] Gain adjusted	11.340%					
NPV Nominal	$2,839,783			$2,850,406	$5,690,189	
Year	**WDCC**	**Depreciation**	**WDCC**	**ROR**	**Total Returns**	**R of R**
1	$5,227,250	$209,090	$5,018,160	$339,771	$548,861	6.5%
2	$5,246,235	$218,593	$5,027,642	$341,005	$559,598	6.5%
3	$5,256,149	$228,528	$5,027,620	$341,650	$570,178	6.5%
4	$5,256,126	$238,915	$5,017,211	$341,648	$580,563	6.5%
5	$5,245,243	$249,773	$4,995,470	$340,941	$590,714	6.5%
6	$5,222,514	$261,126	$4,961,388	$339,463	$600,589	6.5%
7	$5,186,883	$272,994	$4,913,889	$337,147	$610,141	6.5%
8	$5,137,226	$285,401	$4,851,824	$333,920	$619,321	6.5%
9	$5,072,340	$298,373	$4,773,967	$329,702	$628,075	6.5%
10	$4,990,943	$311,934	$4,679,009	$324,411	$636,345	6.5%
11	$4,891,670	$326,111	$4,565,559	$317,959	$644,070	6.5%
12	$4,773,064	$340,933	$4,432,131	$310,249	$651,182	6.5%
13	$4,633,571	$356,429	$4,277,142	$301,182	$657,611	6.5%
14	$4,471,539	$372,628	$4,098,910	$290,650	$663,278	6.5%
15	$4,285,206	$389,564	$3,895,642	$278,538	$668,103	6.5%
16	$4,072,699	$407,270	$3,665,429	$264,725	$671,995	6.5%

[174] NDR stands for Nominal Discount Rate and the Gain adjusted rate is given by
[(1 + real discount rate) x (1 + inflation rate) x (1 + rate of capital gain)] - 1

17	$3,832,022	$425,780	$3,406,242	$249,081	$674,862	6.5%
18	$3,561,056	$445,132	$3,115,924	$231,469	$676,601	6.5%
19	$3,257,543	$465,363	$2,792,179	$211,740	$677,104	6.5%
20	$2,919,084	$486,514	$2,432,570	$189,740	$676,254	6.5%
21	$2,543,130	$508,626	$2,034,504	$165,303	$673,930	6.5%
22	$2,126,972	$531,743	$1,595,229	$138,253	$669,996	6.5%
23	$1,667,732	$555,911	$1,111,822	$108,403	$664,313	6.5%
24	$1,162,354	$581,177	$581,177	$75,553	$656,730	6.5%
25	$607,591	$607,591	$0	$39,493	$647,085	6.5%
Total		$9,375,501		$6,541,999	$15,917,500	

In the case of an increase in asset values at greater than the rate of inflation targeting a 6.5 per cent return on the written down replacement cost will yield a return of (depreciation) and on assets (rate of return) of greater than the initial investment outlay when measured in present value terms. In this particular illustration the present value of the total returns is $5,690,189 at a nominal discount rate of 9.695 per cent.

Table I.4 illustrates the amortisation for a similar asset revalued each year with a 1.5 per cent increase in value above the movement in the CPI each year but with the annual rate of return adjusted to take account of the change in the asset value or gain received.

Table I.4 WDRC with asset price inflation (capital gain)

Capital Expenditure	$5,000,000				
Planned Asset life	25				
Real Discount Rate	6.50%				
Inflation Rate	3.00%				
Nominal Discount Rate	9.695%				
Capital Gain/(Loss)	1.50%				
Gain adjusted NDR	11.340%				
Gain adjusted R of R[175]	4.926%				
NPV Nominal	$2,839,783		$2,160,217	$5,000,000	

Year	WDRC	Depreciation	WDRC	ROR	Total Returns	R of R
1	$5,227,250	$209,090	$5,018,160	$257,500	$466,590	4.9%
2	$5,246,235	$218,593	$5,027,642	$258,435	$477,028	4.9%
3	$5,256,149	$228,528	$5,027,620	$258,924	$487,452	4.9%
4	$5,256,126	$238,915	$5,017,211	$258,922	$497,837	4.9%
5	$5,245,243	$249,773	$4,995,470	$258,386	$508,160	4.9%
6	$5,222,514	$261,126	$4,961,388	$257,267	$518,392	4.9%
7	$5,186,883	$272,994	$4,913,889	$255,511	$528,505	4.9%
8	$5,137,226	$285,401	$4,851,824	$253,065	$538,467	4.9%
9	$5,072,340	$298,373	$4,773,967	$249,869	$548,242	4.9%
10	$4,990,943	$311,934	$4,679,009	$245,859	$557,793	4.9%
11	$4,891,670	$326,111	$4,565,559	$240,969	$567,080	4.9%
12	$4,773,064	$340,933	$4,432,131	$235,126	$576,059	4.9%
13	$4,633,571	$356,429	$4,277,142	$228,255	$584,683	4.9%
14	$4,471,539	$372,628	$4,098,910	$220,273	$592,901	4.9%
15	$4,285,206	$389,564	$3,895,642	$211,094	$600,658	4.9%
16	$4,072,699	$407,270	$3,665,429	$200,626	$607,895	4.9%
17	$3,832,022	$425,780	$3,406,242	$188,770	$614,550	4.9%
18	$3,561,056	$445,132	$3,115,924	$175,421	$620,553	4.9%
19	$3,257,543	$465,363	$2,792,179	$160,470	$625,833	4.9%
20	$2,919,084	$486,514	$2,432,570	$143,797	$630,311	4.9%
21	$2,543,130	$508,626	$2,034,504	$125,277	$633,903	4.9%
22	$2,126,972	$531,743	$1,595,229	$104,777	$636,520	4.9%
23	$1,667,732	$555,911	$1,111,822	$82,154	$638,065	4.9%
24	$1,162,354	$581,177	$581,177	$57,259	$638,436	4.9%
25	$607,591	$607,591	$0	$29,931	$637,522	4.9%
Total		$9,375,501		$4,957,938	$14,333,439	

[175] The Gain Adjusted Rate of Return represents the gains that would need to be earned given a 1.5 per cent pa capital gain and is given by:

(1 + real discount rate) x (1 + capital gain or loss) - 1

Adjusting the annual rate of return earned each year of the life of the asset to reflect the capital gain results in a present value of total returns of $5 million at a nominal discount rate of 9.695 per cent. However, compared to the Inflation Adjusted Historic Cost Approach the amount that is retained in the business as depreciation is significantly greater while the amount the represents the profit (rate of return) is significantly less both in present value terms and actual dollars.

Table I.5 illustrates the position where an asset is revalued each year but where there is a decrease in the value of 1.5 per cent below the annual rate of inflation each year.

Table I.5 WDRC with asset price deflation (capital loss)

Capital Expenditure	$5,000,000					
Planned Asset life	25					
Real Discount Rate	6.50%					
Inflation Rate	3.00%					
Nominal Discount Rate	9.695%					
Capital Gain/(Loss)	-1.50%					
Gain adjusted NDR	8.050%					
Gain adjusted R of R	8.122%					
NPV Nominal	$2,112,924		$2,887,076	$5,000,000		
Year	**WDRC**	**Depreciation**	**WDRC**	**ROR**	**Total Returns**	**R of R**
1	$5,072,750	$202,910	$4,869,840	$412,000	$614,910	8.1%
2	$4,940,696	$205,862	$4,734,834	$401,275	$607,137	8.1%
3	$4,803,726	$208,858	$4,594,868	$390,150	$599,008	8.1%
4	$4,661,723	$211,897	$4,449,827	$378,617	$590,514	8.1%
5	$4,514,572	$214,980	$4,299,592	$366,666	$581,645	8.1%
6	$4,362,151	$218,108	$4,144,044	$354,286	$572,394	8.1%
7	$4,204,340	$221,281	$3,983,059	$341,469	$562,750	8.1%
8	$4,041,012	$224,501	$3,816,511	$328,204	$552,705	8.1%
9	$3,872,042	$227,767	$3,644,274	$314,481	$542,248	8.1%
10	$3,697,299	$231,081	$3,466,217	$300,288	$531,369	8.1%
11	$3,516,651	$234,443	$3,282,208	$285,616	$520,060	8.1%
12	$3,329,964	$237,855	$3,092,109	$270,454	$508,308	8.1%
13	$3,137,099	$241,315	$2,895,784	$254,790	$496,105	8.1%
14	$2,937,918	$244,826	$2,693,091	$238,613	$483,439	8.1%
15	$2,732,276	$248,389	$2,483,887	$221,911	$470,299	8.1%
16	$2,520,027	$252,003	$2,268,025	$204,672	$456,675	8.1%
17	$2,301,025	$255,669	$2,045,355	$186,885	$442,555	8.1%
18	$2,075,115	$259,389	$1,815,726	$168,537	$427,927	8.1%
19	$1,842,144	$263,163	$1,578,981	$149,616	$412,779	8.1%
20	$1,601,955	$266,993	$1,334,963	$130,108	$397,101	8.1%
21	$1,354,386	$270,877	$1,083,509	$110,001	$380,878	8.1%
22	$1,099,274	$274,819	$824,456	$89,281	$364,100	8.1%
23	$836,451	$278,817	$557,634	$67,935	$346,752	8.1%
24	$565,748	$282,874	$282,874	$45,949	$328,823	8.1%
25	$286,990	$286,990	$0	$23,309	$310,299	8.1%
Total		$6,065,666		$6,035,113	$12,100,780	

Under this case study the gain adjusted rate of return that would need to be earned each year would be 8.122 per cent and is given by:

(1 + real discount rate) x (1 + capital gain or loss) - 1

Adjusting the annual rate of return earned each year of the life of the asset to reflect the capital loss results in a present value of total returns of $5 million at a nominal discount rate of 9.695 per cent. In these particular circumstances the amount of depreciation retained in the business is less than with the Inflation Adjusted Historic Cost approach. Conversely, the rate of return or profit is significantly more both in present value terms and actual dollars.

Commentary

In a competitive market any capital gains or losses will be a short term manifestation as firms enter and leave the industry with the effect of bidding away any gains or losses. In such a competitive market, prices will be set so that each firm has returned to it through a combination of a return on capital and a return of capital an amount equal to the present value of the sum they initially invested. In all the cases illustrated with the exception of the unadjusted Written-Down Replacement Cost with Asset Inflation (Table I.4) this condition is satisfied. However, it is this valuation approach that most closely resembles the valuation approach used by Sydney Water in its annual accounts.

A price regulator seeks to set prices that mimic the outcomes that would be achieved under a competitive market. This would require that the annual return earned on an asset in any year be adjusted to reflect the degree of asset inflation or deflation above or below the rate of inflation. Failure to make this adjustment will see water agencies receiving more or less than the present value of their investment outlays.

Economic data suggests that, in the long term, assets become cheaper to replicate due to the influence of technological change. This means that over time there is an expectation that there will be asset price deflation in real terms. This condition holds for a wide variety of assets of different classes. However, water agencies have tended to argue that the nature of their infrastructure is such that assets escalate in price and that the cost of replication will be greater in real terms that the initial cost. This argument tends to be vigorously prosecuted where there is an expectation that a price regulator will not make the appropriate adjustments to ensure that the rate of return earned in any year is adjusted to reflect the capital gain or loss (ie, a Table I.3 outcome).

Inflation Adjusted Historic cost (also known as Current Cost) obviates the need to have an ongoing debate about whether assets are increasing or decreasing in value. The approach does ensure that over time the water agency recoups the value of their initial investment outlay, measured in present value terms, through a return on and of capital. This approach takes a financial view of the asset and seeks to ensure that

the financial value of the water agency is maintained. It can also mean that the value of assets used for pricing purposes is detached from that underlying physical assets.

Apart from the timing of cash flows there is little reason to favour any of the approaches over another provided suitable adjustments are made if and when revaluations are made to re-establish the identity of:

$$PV \Sigma (prices \times quantity) = PV \Sigma (Assets \times Rate\ of\ Return + Operating\ Costs)$$

However, as it is intended that cash flows under the various approaches will be equated to the initial outlay it is questionable whether there is a need to go to the expense of revaluing assets for pricing purposes. What is important is the transparency in the approach adopted.

I.3 Differences due to the approaches adopted by IPART and Sydney Water

Inevitably asset valuation methodologies chosen to suit different purposes will vary in form and application. Asset valuation is subjective under all of these choices. The following section provides some insight into differences that have evolved because of the valuation methodologies chosen by Sydney Water and IPART.

I.3.1 Recoverable amount methodology

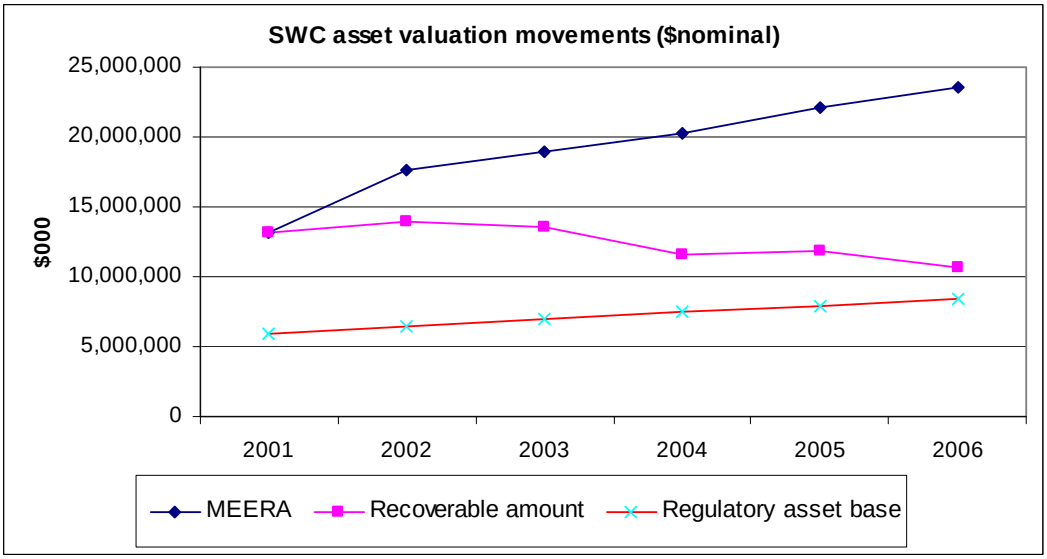
IPART's initial RAB calculation is alike in concept to the recoverable amount test performed by Sydney Water for accounting purposes. Both are based on the net present value of future cash flows at price levels current at that time. Both present a financial capital valuation of SWC's assets. However, the values of each vary significantly.

IPART's initial line-in-the-sand valuation for its RAB in 2000/01 resulted in a value of $5.9 billion. Under the current versions of the Australian Accounting Standards defining the principles of the recoverable amounts test, it would be anticipated that the carrying amount of the assets subject to price regulation would approximate the RAB. However, the initial assumptions and the associated recoverable amounts test model validated by Sydney Water's auditors resulted in a carrying value of $13.103 billion at 30 June 2001. The requirements of Australian Accounting Standards for the recoverable amounts test in 2001 differ from those currently in place. Even so, the discrepancy is large when both valuations are based on similar methodologies.

While the RAB values have been updated each year by rolling forward the initial RAB value, the recoverable amount values have been updated by re-performing the NPV calculation. Since 2001, the value of the RAB has steadily increased (see Figure I.1 below). The corresponding values of the recoverable amount calculated by Sydney Water have been more variable and with an overall downward trend

inducing the decrease in the value of the Asset Revaluation Reserve. The downward trend is not unexpected given that IPART is only granting income each year to support a much lower RAB. Therefore, while there is no direct impact on either the RAB or the carrying value of assets, some of the impairment of the fair value of assets subsequent to 2000/01 is a result of the carrying value of assets not being similar to the initial RAB value in that year.

Figure I.1 Movements in asset valuation



Another influence results from a price setter's objective to seek smooth transitions in prices. The RAB methodology provides stability in asset valuations. The annual recoverable amount calculation will be more reflective of short term changes in operating conditions (such as high consumption levels in periods of drought and low consumption levels in periods of high rainfall) but over time results from both methodologies should be similar.

It also appears that there is also an inconsistency in the way Sydney Water calculates its recoverable values compared to the way it calculates its MEERA values. For recoverable amount calculations, Sydney Water excludes capital contributions revenue from cash inflows on the basis that these revenues relate to the construction of new assets rather than revenues from existing assets. Assets handed over to SWC by developers (Assets Free of Charge) are also excluded on the same basis. However, in practice the methodology for calculating developer charges provides revenues that at any time include components for both existing and future assets. Moreover, SWC states in its submission to IPART's developer charges review that "pre-1996 assets dominate the overall capital value currently recovered through developer charges"[176]. For MEERA calculations, SWC includes values for capital contributions and contributed assets. This inconsistency increases the gap between the two valuations.

[176] Sydney Water Corporation submission to IPART Review of Developer Charges, p 19.

I.3.2 MEERA valuation methodology

Much of the concerns of the Auditor-General and Sydney Water relate to the gap between the replacement values of Sydney Water's assets (measured by MEERA valuation) and their cash generating capability (measured by the recoverable amount).

The revaluation process used by Sydney Water has seen the MEERA values of its system assets rise from $13.1 billion in 2000/01 to $23.5 billion in 2005/06 (Figure I.1 above), an increase of $10.4 billion or 79 per cent. Capital expenditure over the period was $3.0 billion including expenditure on growth assets, or $2.6 billion without. This suggests that over $6.0 billion or 70 per cent of the increase is due to the capital gain attributable to revaluation.

The value of the RAB rose from $5.9 billion in 2000/01 to $8.4 billion in 2005/06, an increase of $2.5 billion.

While there are differences in approach, the size of the increase in MEERA values compared to the increase in RAB value is very high, especially as the capital expenditure levels included by both methods over the period are the same.

A contributing reason for the MEERA valuations increasing at a faster rate than the RAB values is that the MEERA valuations include values for assets donated by or funded by third parties (see Section 3.1.3 following). This difference in approach is accentuated by the MEERA revaluation process. In its submission to IPART's review of developer charges, Sydney Water comments that MEERA valuations for assets for developer charges purposes tend to exceed efficient costs over time[177]. Sydney Water proposes that, for developer charges purposes, existing MEERA valued assets not be revalued unless there is genuine excess capacity.

Therefore a potential problem when using a MEERA type revaluation process from a pricing perspective is that utilities could receive large increases in prices without any comparable increase in investment. If IPART was to regularly revalue its RAB in the same manner as Sydney Water does under the MEERA process, then agencies could potentially recover the cost of their investment many times over and earn returns greatly in excess of commercial levels.

I.3.3 Contributed assets and cash contributions

As previously detailed, under IPART's (and generally accepted) regulatory pricing principles contributed assets are excluded from the RAB while cash contributions received reduce the RAB value upon which revenue requirements are based. However, under Australian Accounting Standards such assets are brought to account at fair value through the profit and loss account in the agency's books and are then accounted for within the books of account along with all other assets.

[177] Sydney Water Corporation submission to IPART Review of Developer Charges, p 20.

Therefore a significant part of the difference between the value of IPART's RAB and the fair value of the asset base calculated under Australian Accounting Standards is attributable to the differing treatment of contributed assets and cash contributions. In practice, this treatment accounts for a significant portion of the level of impairment of Sydney Water assets under accounting rules.

In addition, under regulatory pricing principles it is solely the contributed assets and cash contributions that are impacted. Under Australian Accounting Standards, the impairment is required to be allocated proportionally across all assets of the cash generating unit. In the case of Sydney Water, this means that the impairment is allocated across all assets because Sydney Water is treated as a single cash generating unit for impairment testing. Hence the value of all assets is reduced rather than what may be a more informative approach of reducing the contributed assets to zero value.

This presentation of reflecting the impairment against the entire asset base gives third-party readers of the financial statement the impression that the revenue levels are insufficient to support the entire asset base whereas the basis of the impairment predominantly results from the value of the contributed assets being factored into the MEERA valued asset base at a positive value.

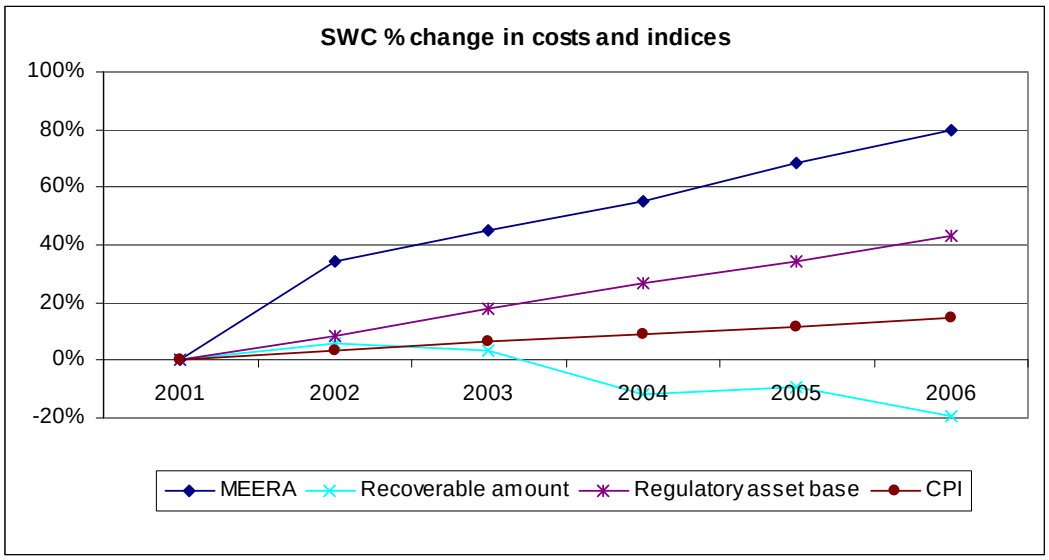
It should also be recognised that when the water utility eventually replaces these externally funded assets at the water supplier's own expense, IPART includes the cost in the cost of service provision earning a full return on and of the asset. Consequently over the long term, the RAB value should rise towards the carrying value reported in the financial reports as well as regulated revenues rising to reflect these costs.

I.3.4 Indices used in valuation calculations

Sydney Water has to regularly revalue its assets and in practice carries out MEERA revaluations on different categories of system assets in progressive cycles (not exceeding five years) to arrive at the fair value. MEERA valuations in the intervening years of the five year cycles are carried out by indexing the values by a general construction industry index. For pricing purposes IPART has adopted a financial capital view of asset valuation where investments are adjusted each year in line with changes in inflation.

Since 2000/01 the general construction index used by Sydney Water has risen at a faster rate than CPI. While this is not the only influence on changes in asset valuation, by itself this would have caused MEERA valuations to rise more quickly than RAB valuations and recoverable amount valuations.

Figure I.2 Percentage change in costs and inflation



The fair (MEERA) value of assets for financial reporting reflects the specific economic conditions as at the date of valuation. The RAB on the other hand reflects the movement in CPI. While changes in the costs of infrastructure will impact CPI over time, there is a time lag ie, Sydney Water's water price, which will impact CPI, will increase as costs increase at a greater rate than CPI. Over the long term the changes in CPI and changes in the costs of infrastructure construction should be approximately the same.

I.3.5 Capitalisation of borrowing costs

When valuing assets under the MEERA process Sydney Water includes the costs of borrowing related to the funding of the assets. Borrowing costs are capitalised where the funds are borrowed specifically for the acquisition, construction or production of an asset (however on undertaking an engineering based revaluation of assets Sydney Water does not include a factor for interest incurred).

IPART does not include the cost of borrowing when valuing an asset. The IPART process for determining prices includes application of a return on assets. Under this method including the costs of borrowing in an asset's value as well as allowing a return on the cost of the asset would see the cost of borrowing recovered twice.

Therefore initial valuations of assets under Sydney Water's MEERA methodology will be higher than under the IPART RAB process.

I.3.6 Financial viability

IPART measures the strength of an agency's financial position by the use of financial ratio analysis. Along with other requirements required under its legislation, IPART

uses the results of the ratio analysis as an input into its final decision on the level of prices to be adopted. IPART particularly relies on indicators based on cash flows because these are not as subjective as indicators that use non-cash components such as depreciation. IPART's method is a departure from calculations often used for accounting purposes.

At the last determination in 2005 IPART provided prices that, under the forecasts adopted at that time, would result in levels of ratios that were in line with NSW Treasury's policy of a minimum of a BBB rating. IPART also assumed a dividend payout consistent with past performance.

IPART's analysis of its prices for this determination indicates that Sydney Water should achieve a minimum of a BBB credit rating, be able to earn a reasonable rate of return and pay reasonable dividends.

But financial viability is also a result of management of the financial position of the company. This is particularly relevant in a time of intensive capital investment. It is imperative that Sydney Water is supported financially by its shareholder as it undertakes extensive works to safeguard drinking water supplies. Sydney Water's management needs to have the flexibility in its tax management and dividend policies to better balance its future financial outcomes. In the short term, the situation may arise where Sydney Water's shareholder may need to accept a lower level of cash extraction from the business to ensure financial sustainability ie retention of funds in the business in place of higher levels of debt. Alternatively, Sydney Water's stakeholder may have to accept a level of lesser financial performance for a short period of time when capital expenditure levels are abnormally high. However, this will be reflected in lower financial ratios with the chance of a reduction in Sydney Water's credit rating.

I.4 Conclusion

Sydney Water is concerned about its financial sustainability and believes that higher prices are needed to alleviate this concern. Sydney Water believes that a contributing factor is the method of asset valuation adopted by IPART.

The Auditor-General is concerned about the gap between Sydney Water's replacement asset values and their cash generating capability. He is concerned about the potential impact on Sydney Water's ability in the future to replace its system assets and to pay dividends to its shareholders (the NSW Government).

Asset valuation methodologies are chosen in line with the purpose intended but this can lead to differences when they are applied. IPART's original line-in-the-sand valuation was lower than Sydney Water's replacement cost valuation. It was adopted because IPART was concerned that past decisions regarding asset construction may not have been made for strictly economic reasons.

Although based on similar calculation principles, IPART's original line-in-the-sand value was also lower than Sydney Water's recoverable amount calculation. While IPART rolls forward its RAB values each year, Sydney Water recalculates its recoverable amount values. IPART's RAB values have steadily increased over time while Sydney Water's recoverable amount values have been variable with an overall decrease. This has led to problems in Sydney Water's financial reporting with negative impacts on the Asset Revaluation Reserve.

Over time Sydney Water's replacement values have accelerated at a much faster rate than either the RAB or the recoverable amount values. Accounting rules aim to provide readers of financial statements with a financial view of an entity at a point in time. MEERA valuations may serve this purpose. Economic regulators aim to replicate conditions in a competitive market. Their processes provide values for companies as if they were ongoing concerns in that market.

The IPART price determining process excludes values for assets contributed by developers or funded by developers. Effectively no rate of return of or on the cost of the developer funded or contributed asset is earned on the basis that a business is not entitled to earn any revenue from assets that have cost the business nothing. This reduces the RAB value compared to Sydney Water's MEERA values.

Pricing principles reward prudent investment and IPART takes a financial capital maintenance approach. Therefore investments in assets are indexed by the CPI. Sydney Water's asset replacement cost method increases asset values by a general construction industry index. Since 2001, the general construction index has risen at a faster rate than CPI.

The IPART pricing process excludes the cost of borrowing from asset values. Under this process, inclusion would see the cost recovered twice. Under Sydney Water's MEERA process, the cost of borrowing is included in the initial valuation of the asset.

While IPART is an economic regulator, its pricing decisions are made with regard to a number of factors including the impact on the financial viability of the utility, the impact on the environment, the impact on returns to shareholders, and the impact on customers. The process rewards prudent investment so that customers are not penalised for inappropriate utility decisions. The process allows utilities to run their businesses in a commercial manner. Being a forward price setting process, results are dependent on forecasts of expenditure and consumption being achieved.

The IPART pricing process allows prudent asset replacement at the full cost of the asset. Forecast replacement capital expenditure proposed by Sydney Water is added to the RAB and this allows Sydney Water to recover the cost of the assets and to earn a return on them. Therefore Sydney Water is able to replace its system assets at contemporary costs.

Unlike accrual accounting methods used for financial reporting, IPART uses a cash flow basis to forecast financial viability. IPART models the impact of its prices and ensures that there is sufficient cash flow to enable utilities to operate at a commercially acceptable level and to pay an appropriate level of dividends to their shareholders. For this determination, IPART's determined prices should allow Sydney Water to achieve a minimum BBB credit rating and pay a reasonable level of dividends.

The procedures adopted by IPART are designed to ensure that utilities under its control have the means to manage their businesses in a commercial manner. Other regulators may have different processes, but IPART is confident that its methods are appropriate for the purpose of price determination and to fulfil its obligations under section 15 of the IPART Act.

J Calculation of the LRMC for water

J.1 Introduction

At IPART's 2005 pricing review, the Government's Metropolitan Water Plan provided a basis for estimating marginal costs. A range of marginal cost estimates were derived based on different combinations of works and activities that were planned to bring the demand and supply of water in Sydney into balance. The work undertaken at the time suggested that the LRMC of water in Sydney was in the range of $1.20 to $1.50 per kilolitre ($2004/05) depending on the combination of supply side and demand management initiatives likely to be put in place. At the time, these estimates were higher than the then prevailing water price. IPART has recalculated the LRMC for this determination.

J.2 Sydney Water's Desalination Plant

Sydney Water is in the process of constructing a 250ML/day desalination plant at Kurnell. This plant has the potential to be expanded from the presently planned 250ML/day to 500ML/day should water demands increase to an extent to warrant this. This ability to expand the plant effectively presents Sydney Water with its next best water supply augmentation option, and provides a basis for making an estimate of the marginal cost of the next increment of supply.

Sydney Water plans to spend approximately $2 billion on Stage 1 of the desalination plant made up of the following:

Table J.1 Desalination plant costs

Expected Capitalised Costs [a]	$M
Water distribution infrastructure	525
Project development costs	48
Seawater intake system	199
Seawater concentration outlet system	60
Desalination Plant	799
Pre-operations payment	9
Pumping Station	42
Land Acquisition	51
SDP Project development capital costs	185
Total	**1918**

[a] Estimates include capitalised interest from the date of expenditure until 30 June 2009.

Source: Sydney Water submission, 14 September 2007, pp 47 and 49.

The pipeline from the desalination plant site at Kurnell across Botany Bay is to be sized at the ultimate capacity of 500ML/day. Similarly all land requirements will be secured as part of the initial phase and will not be costs incurred in subsequent phases. The seawater inlet and outlet systems will also be sized to ultimate capacity.

The desalination plant itself will have to be upsized to increase capacity to 500ML/day as will the pumping station. It has also been assumed that Sydney Water or their contractors will incur additional project development costs for the second stage. For the purpose of estimating the marginal cost of upgrading the plant to 500ML/day the following additional costs have been assumed.

Table J.2 Desalination Plant Stage 2 Costs

Expected Capitalised Costs	$M
Desalination Plant	799
Pumping Station	42
SDP Project development capital costs	185
Total	**1026**

Sydney Water estimates that the operating expenditure for a 250ML/day plant based on 100 per cent utilisation will be $55 million per year. Sydney Water intends to operate the plant at 100 per cent of capacity for the first two years.

For the purpose of estimating marginal cost it is important to understand how operating costs will change with variations in output. Sydney Water's submission points out that approximately 50 per cent of operating costs relate to electricity costs. Overall, Sydney Water estimates that approximately 70 per cent of operating costs will vary with variations in output.[178]

J.3 Marginal Cost Estimation

There are a number of different specifications of marginal cost ranging from the simple to the complex. At the time of the IPART's last determination in 2005 an Average Incremental Cost specification was used. This specification is defined as:

$$\text{Average Incremental Cost} = \frac{\text{Least cost investment to equate demand and supply}}{\text{Incremental output resulting from the capacity expansion}}$$

all measured in present value terms.

IPART is to use the same specification on this occasion.

One further factor that needs to be considered in the estimation of marginal costs is the likely utilisation rate of the plant. While Sydney Water intends to run the plant at full capacity for the first two years to prove the plant, subsequent to that period it is intended to only operate the plant when water storages fall below 70 per cent to 80 per cent. The frequency of operation is therefore uncertain and depends not only on rainfall but other factors that may influence water capture and storage such as other augmentation works that may be considered by the Sydney Catchment Authority. On the other hand requirements to increase environmental flows could see the plant operating more frequently. It is understood that further consideration on the quantum of environmental flows is to take place in 2015.

Based on the assumptions about costs outlined above and assuming a plant life of 30 years[179] the following estimates of marginal cost have been made based on different utilisation rates and costs of capital. These estimates assume that construction of the second stage of the plant commences now.

[178] Sydney Water submission, 14 September 2007, p 51.

[179] This is consistent with Sydney Water's estimated life for the plant. The pumping station has a life of only 25 years while the inlet and outlet works have lives of up to 100 years.

Table J.3 Average incremental cost estimates

WACC	6.5%	7.1%	7.5%
Utilisation Rate			
100%	$1.48	$1.53	$1.57
90%	$1.60	$1.65	$1.69
85%	$1.66	$1.73	$1.77
80%	$1.74	$1.81	$1.85
75%	$1.83	**$1.90**	$1.95
70%	$1.93	$2.01	$2.06
65%	$2.05	$2.13	$2.18

At a weighted average cost of capital of 7.1 per cent the marginal cost of water ranges from $1.53 with a 100 per cent utilisation rate to $2.13 with a utilisation rate of just 65 per cent.

Opting for a 75 per cent utilisation rate would be a relatively conservative assumption and would yield a price of $1.90 if the second stage of the plant were to be constructed now. However, a further stage of the desalination plant is unlikely to be required before 2015, at the earliest. IPART has taken into account such a lag in the need for construction of a further stage and developed a managed price path to transition from the current water usage price levels to a price equivalent to a marginal cost of $1.90 by 2015.

The managed price path yields a water usage price of $1.83 by 2011/12, the last year of the price path to be covered by this determination. Prices would then need to increase in real terms by 1 per cent per year until the price of $1.90 is attained in 2014/15.

Glossary

ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACG	The Allen Consulting Group
CAPM	Capital Asset Pricing Model
CGS	Commonwealth Government Securities
COAG	The Council of Australian Governments
CPI	Consumer Price Index
DBOM	Design, Build, Operate and Maintain
DECC	Department of Environment and Climate Change
Evans Peck	Evans and Peck Pty Ltd
EWON	The Energy and Water Ombudsmen NSW
GL	Gigalitre
GST	Goods and Services Tax
Halcrow	Halcrow Pacific Pty Limited
IBT	Inclining Block Tariff
IPART	Independent Pricing and Regulatory Tribunal
IPART Act	The *Independent Pricing and Regulatory Tribunal Act 1992*
kL	Kilolitre
LCD	Litres per capita per day
LRMC	Long run marginal cost

Minister	The Minister for Water Utilities
ML	Megalitre
MMA	McLennan Magasanik Associates
MRP	Market Risk Premium
NPV	Net present value
PED	Price elasticity of demand
PIAC	Public Interest Advocacy Centre
RAB	Regulatory asset base
RBA	Reserve Bank of Australia
Replacement Flows Project	The Western Sydney Recycled Water Initiative Replacement Flows Project
SCA	Sydney Catchment Authority
SDP	Sydney Desalination Plant Pty Ltd
SOC	State-owned corporation
STP	Sewage treatment plant
SWC	Sydney Water Corporation
TEC	Total Environment Centre
The Association	The Waste Contractors and Recyclers Association of NSW
UNSW	University of New South Wales
WACC	Weighted average cost of capital