

fax received on 8/9/07.
[Signature]

08

Date: 17 September 2007

FAX TO: (02) 6207 5887

To: Paul Baxter
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No. of pages incl. this one:
19

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From: Scott Crawford
35 Onkaparinga Crescent KALEEN ACT 2617
Telephone: (02) 6161 0100 (H): (02) 6121 6109 (W).

Subject: Input into investigation into prices for water and
wastewater services for the period beginning 1 July 2008

Dear Paul

Thank you for your letter dated 20 August 2007 and for forwarding a copy of 'Report 8 of 2007. Water and Wastewater Discussion Paper 3. Prices' with it.

I understand from your letter that ~~today~~ ^{yesterday was} is the due date for submissions on that paper. ~~Please~~ ^{nevertheless, please} accept this fax as a submission on that paper. Thanks.

WASTEWATER PRICING

I found the abovementioned paper informative and, amongst other things, it has helped develop my ideas about wastewater pricing. See below for details, but I am now favouring a two-part tariff approach to residential (excluding 'Flats/Units') wastewater pricing system involving a fixed quarterly charge plus a water consumption based volumetric charge where the volumetric charge is adjusted up or down (using a pro-rata method) by a standard percentage dependent on both the seasons of the year and the Stages of water restrictions in force during the metered period.

As mentioned in the abovementioned paper, while the current fixed price wastewater pricing regime in the ACT has the advantages of being quite simple (reducing administration costs), very transparent and easy to understand, its disadvantages include not distinguishing between customers producing large amounts of wastewater and those producing only a small amount.

To address this particular disadvantage, I propose that for the five year period from 1 July 2008 *ACTEW Corporation Ltd.* move to and use a two-part tariff approach to quarterly residential (excludes 'Flats/Units') sewerage charges involving:

- a) a fixed charge; and
- b) a volumetric charge based on metered quarterly water consumption, where the pro-rata volumetric charge rate(s) applying depend on:
 - i) the Stage(s) of water restrictions in force; AND
 - ii) the season(s) of the year during the metered period.

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The water restrictions aspect of this proposal may be less appropriate for flats/units/apartments in comparison to most other dwelling types (such as separate houses to perhaps a lesser extent semi-detached/row or terrace houses, and townhouses).

This proposed system effectively attempts to estimate how much wastewater each ACT residential water and sewerage customer produced during the metered period and then to charge them for it on a per quantity basis via the volumetric charge. The price structure can be adjusted so *ACTEW Corporation* meets its effective costs regarding wastewater.

Quarterly residential sewerage charges for the year beginning 1 July 2008 could look something like the following:

- a) a fixed sewerage supply charge of \$43.00; and
- b) a sewerage-related volumetric water consumption charge with metered water consumption (for sewerage pricing purposes) charged on a pro-rata basis from the start date of each new season/(water restrictions)/(financial year) combination according to the rates in the table below:

2008-09 sewerage-related water consumption charges (\$/kL)

Season of year	ACT water restrictions Scheme Stage					
	PWCM* only	1	2	3	4	5
Summer	?	0.48	0.58	0.79	1.27	1.51
Spring or Autumn	?	0.76	0.84	1.04	1.34	1.51
Winter	?	1.14	1.19	1.31	1.56	1.70

Notes: PWCM means Permanent Water Control Measures.

The above proposed 2008-09 quarterly residential sewerage charges assume:

- a) the amount of wastewater produced by each ACT residential water and sewerage customer (at the relevant property) is directly proportional to that customer's estimated water consumption during a winter when the tightest Stage of water restrictions is constantly in force;
- b) each such customer's wastewater is of the same type and strength on any given day during the metered period;
- c) ACT residential water and sewerage customers' water consumption rates will, on average, vary directly in line with publicly available target average daily water consumption rates (in megalitres per day) for the different combinations of seasons of the year (summer, spring/autumn and winter) and ACT water restrictions Scheme Stages;

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- d) the proposed volumetric charges are calculated on a pro-rata basis with consumption (for sewerage pricing purposes) from the start date of each new season/(water restrictions)/(financial year) combination at the relevant new rate;
- e) ACT residential sewerage charges increase by 3.75 per cent per annum between 2006-07 and 2008-09 (from \$398.80/year/customer in 2006-07);
- f) 40 per cent (before adjustments for increased administration and risk reduction costs etc) of the total quarterly ACT residential sewerage charges are covered by the residential customers' sewerage-related fixed charges;
- g) about \$0.07 (in 2008-09 dollars) has been added to the quarterly 2008-09 fixed sewerage supply charge of each ACT residential water and sewerage customer to account for some increased administration costs, provide a small element of risk reduction and to round the quarterly fixed charge to the nearest dollar;
- h) on average, 60 per cent (before adjustments for increased administration and risk reduction costs) of the total quarterly ACT residential sewerage charges are covered by the residential customers' sewerage-related volumetric water consumption charges;
- i) a five-Stage ACT water restrictions scheme, although I understand the current water restrictions scheme may have only four Stages; and
- j) it is valid to extrapolate mainly 2003-04 data (including seasonal and water restriction Stage combinations) - and in one case 1983 to 1986 data - to 2008-09 using the methodology described below.

Changing to this proposed method of wastewater pricing would have the advantages of:

- a) removing much of the wastewater charge related inequity between ACT residential customers in larger households and those in smaller households;
- b) generally providing better estimates of the amount of wastewater a particular residential customer produces relative to other such customers than would be achieved by using customer water consumption levels alone (or even customer winter water consumption levels alone);
- c) providing more stable revenue to the service provider than if the volumetric charge for wastewater was based on the water and sewerage customer's water consumption level alone;
- d) providing some price-based incentive for individual customers to limit their production of wastewater (as part of an incentive to limit their general level of water consumption);
- e) being fairly understandable in its rationale and therefore capable of winning support from ACT residential water and sewerage customers; and

- f) being administratively feasible:
- i) the pro-rata billing methodology is already in place; and
 - ii) in terms of changes to billing procedures, the main new unknown during each billing period would be the date(s) (if any) when a different Stage of water restrictions began - the ACT Government may provide enough advance warning of a change in the Stage of water restrictions to allow sufficient time for the necessary programming to be done without any delay to the provision of residential water and sewerage bills.

Methodology Used

The methodology used to estimate a \$1.70/kilolitre 2008-09 ACT residential (where 'residential' excludes 'Flats/Units') water and sewerage customer's sewerage-related volumetric water consumption charge for a winter when Stage 5 water restrictions are in force is as follows:

Wastewater volumetric charge rate (2008-09) for a winter with Stage 5 water restrictions (residential customers)

$$= \frac{\text{Volumetric charge portion of customer's total 2008-09 wastewater charge}}{\text{Average customer's annualised 2008-09 (winter, St. 5) water consumption}}$$

where

Volumetric charge portion of customer's total 2008-09 wastewater charge

= (2006-07 fixed wastewater charge) multiplied by

(Portion of 2008-09 wastewater charge assumed to be covered by sewerage-related volumetric water consumption charge) multiplied by

(Assumed increase in average ACT residential customer's wastewater charges between 2006-07 and 2008-09)

$$= (\$398.80) \times (0.6 [60\%]) \times ((1.0375)^2 [\text{an annual increase of } 3.75\%])$$

= about \$257.56

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and

Average customer's annualised 2008-09 (winter, Stage 5) water consumption

= ((Publicly available (probably in 2003-04) target average daily water consumption rate (in megalitres per day) for the combination of the season of winter and Stage 5 ACT water restrictions) divided by

((Estimated number of sewerage customer accounts in 2003-04) multiplied by (Estimated proportion of ACT 2003-04 household dwelling structures that are not a 'Flat/unit/apartment' [from ABS cat. no. 4130.0.55.001, p. 41])) multiplied by

(Estimated proportion [in 1983-1986] of the ACT's treated water consumed by residential (excluding 'Flats/Units') users) multiplied by

(Average number of days per year in the 2008-09 to 2013-14 period) multiplied by

(An adjustment for an average reduction in per capita consumption of mains water over the five years from 2003-04 to 2008-09 in line with a *Think Water, ACT Water* targeted reduction of 12% by 2013 (the latter reduction being assumed to occur over a nine-year time period and at a constant rate per year))

= $\left(\frac{78 \text{ megalitres/day}}{(128.446 \times (1-0.112))} \right) \times (0.652 [65.2\%]) \times (365.2 \text{ days}) \times (1 - 0.0141)^5$

= about 151.67 kilolitres.

So using the above estimates

Wastewater volumetric charge rate (2008-09) for a winter with Stage 5 water restrictions (residential customers)

= Volumetric charge portion of customer's total 2008-09 wastewater charge

Average customer's annualised 2008-09 (winter, St. 5) water consumption

= $\frac{\sim \$257.56}{\sim 151.67 \text{ kilolitres}}$

= $\sim \$1.70/\text{kilolitre}$.

Attached are copies of parts of certain publications etc used in calculating the above estimates, including:

- 1) extracts from 'Report 9 of 2007, Water and Wastewater Discussion Paper 3, Prices' including:
 - i) the cover page;
 - ii) page 5 (mentions the *Think Water, ACT Water* target to reduce per capita consumption of mains water by 12% by 2013; and
 - iii) page 42 (includes Table 5 containing the ACT's fixed residential wastewater charges for 2006-07 and 2007-08).
- 2) a copy (over four A4 pages) of a double-sided partly orange-toned A3 sheet possibly dated around 2003-04 and:
 - i) titled 'Scheme of restrictions on the use of water from ACTEW Corporation water supply system' on one side; and
 - ii) titled 'Water restrictions Scheme' on the other side and including on that side the target average daily water consumption rates (in megalitres per day; for combinations of the seasons and Stages of ACT water restrictions) I have used in this proposal.
- 3) a copy of page 81 of 'ActewAGL Annual Report 2006' including the number of sewerage customer accounts for 2003-04 (128,446);
- 4) a copy of page 41 (Table 25) of ABS cat. no. 4130.0.55.001 (*Housing Occupancy and Costs*) for 2003-2004 including estimates of the proportions of ACT households in 2003-04 with different types of dwelling structure;
- 5) extracts from the December 1992 'Consultancy Report 92/45' titled 'The Water Future of the ACT: A Community Discussion Document on the Major Issues' including:
 - i) two cover pages;
 - ii) page 5 (Figure 3 there has a pie chart for the 'Users of treated water in the ACT, 1983-1986' where the components of the pie chart include 'Residential 65.2%' and 'Flats/Units 4.1%'); and
 - iii) page 30 (a References page including the source for page 5's Figure 3 (National Capital Development Commission 1989, *ACT Water Policy Plan.*)).



independent competition and regulatory commission

Water and Wastewater
Discussion Paper 3
Prices

Report 08 of 2007
August 2007

Government policy that potentially influences the decisions of the Commission includes the *Think Water, Act Water* (TAWW) strategy document released in April 2004.²

The aims of the TAWW strategy are to:

- increase the efficiency of water usage in the ACT
- provide a long-term, reliable source of water for the ACT and region
- develop a cross-border (ACT–New South Wales) water supply agreement
- protect the water quality of the ACT and surrounds
- incorporate water-sensitive urban design principles into urban, commercial and industrial development
- promote and provide for community involvement in the management of ACT water resources.

Targets to reduce per capita consumption of mains water by 12% by 2013 and 25% by 2023 are included under the goal of increasing water use efficiency. A target of increasing reclaimed water use from 5% to 20% by 2013 is also included.

The TAWW foreshadowed the introduction of Permanent Water Conservation Measures (PWCM), which were introduced on 31 March 2006. The measures included restrictions on the types of hose fittings that could be used and the manner in which houses, cars, and lawns could be watered. The aim of the PWCM is to reduce water consumption by 8% per year.³ It is necessary that the Commission consider the impact of these policies in its decisions on the pricing of water and wastewater services provided by ACTEW.

Another ACT Government policy that impacts on the Commission's decisions on the pricing of water is the WAC, a charge levied by the ACT Government on water taken from the catchment. The amount of the charge is determined by the ACT Government and applied on a per kilolitre basis. The charge is currently 55 cents per kilolitre and the revenue received is passed by ACTEW to the ACT Government. The first 25 cents per kilolitre are used to offset costs incurred by the ACT Government related to catchment management, the scarcity value of water and environmental costs such as environmental flows. The revenue received from the remaining 30 cents per kilolitre 'provides a return on a valuable resource and assists in managing demand'.⁴

The Commission has no role in determining the level of the WAC, although it has previously advised the ACT Government on a methodology for calculating the WAC.⁵ It should also be noted that as ACTEW does not receive revenue from the WAC, this revenue is not used to offset the total efficient costs of ACTEW. However, the WAC significantly increases the marginal cost of water. It is therefore necessary to consider the elasticity effect of the WAC when determining water tariffs. This issue is discussed further in Chapter 3.

² *Think Water, Act Water* and related documents are available from Environment ACT or from the TAWW website, at www.thinkwater.act.gov.au

³ J Stanhope MLA, *New water saving measures for Canberra*, media release, ACT Government, Canberra 22 Mar 2006; ACT Department of Territory and Municipal Services, 'Permanent water conservation measures in the ACT', pamphlet, ACT Government, Canberra, Mar 2006.

⁴ ACT Treasurer's response to Question on Notice number 60 during the 2006 Select Committee on Estimates. The response can be located at: <http://www.parliament.act.gov.au/downloads/issues-papers/Stanhope%20Treasurer%202006.pdf>

⁵ ICRC, *Final report: water abstraction charge*, ICRC, Canberra, Oct 2003.

Table 5 ACT wastewater charge (\$ nominal)

Wastewater	2005-06	2005-06	2006-07	2007-08
Service charge (\$/pa)	375.32	389.00	398.80	413.76
Fixtures charge for non-residential properties (fixture/pa)	366.20	380.72	390.00	404.68

4.4 Current arrangements—other jurisdictions

4.4.1 Western Australia

The ERA separates wastewater charges into two categories, residential and non-residential. Residential wastewater charges are linked to the estimated rental value of the property and increase as rental values increase. Non-residential wastewater charges consist of a fixed charge based on the number of fixtures and a usage charge. The usage charge applies to wastewater produced in excess of 200 kilolitres. The ERA applies this to situations where the volume of wastewater can be measured or approximated with reasonable accuracy.

While residential wastewater prices are based on the property's gross rental value, the ERA considered this to be inconvenient because it was complicated, lacked transparency and was costly to administer. In its recent price determination for water the ERA decided that the current charging structure should be replaced by a simpler and more transparent charging structure. Its decision was:

The Authority recommends that a four-block inclining tariff be introduced for residential wastewater charges. Initially, households would be placed in the different blocks based on the current gross rental values of their properties. The Corporation would then move each household over a four-year period to the average charge for the particular block that each household is allocated to. New households, including those households that move, would pay the average charge. Under this approach, the gross rental value methodology would not be required after the initial placement of households to their respective blocks.⁶⁶

The ERA charges a two-part tariff for non-residential wastewater, which consists of a fixed price and a volumetric price. This is because:

The Authority is of the view that this is appropriate in circumstances where volumes of wastewater discharged to sewerage systems can be measured or otherwise determined with reasonable accuracy. The efficiency of volumetric charging is further enhanced because customers have some ability to alter discharges of wastewater in response to prices (for example, to implement technologies that reduce wastewater discharges).⁶⁷

The ERA recommended that the current non-residential wastewater fixed charges, which are based on the number of fixtures, be maintained, whilst the variable charges be reduced over the years.

⁶⁶ ERA, *Final report: inquiry on urban water and wastewater pricing*, op cit., p. xv.

⁶⁷ *ibid.*, p. 53.

Scheme of restrictions on the use of water from ACTEW Corporation water supply system

When it considers that it is necessary or desirable to do so in order to ensure that, on a medium to longer-term sustainable basis, it is able to meet its obligation under section 84 of the *Utilities Act 2000* to supply potable water in accordance with its standard customer contract, ACTEW Corporation Limited must:

- ▶ after consultation with the Minister and the environment protection authority; and
- by reference to the capacity or quality of stored water available to it and/or the level of reduction in current and future water consumption which it considers necessary, declare, under Regulation 8 of the *Utilities (Water Restrictions) Regulations 2002*, that water restrictions under a Stage specified in the table below are in force.

In deciding which Stage of restrictions should be in force, ACTEW may have regard to:

- ▶ currently available weather forecasts and other meteorological advice;
- ▶ daily consumption levels in the immediately preceding period;
- ▶ the desirability of avoiding excessive reliance on only one of the ACT's two water catchments;
- ▶ daily consumption levels in corresponding periods in previous years;
- ▶ the possibility that, if restrictions do not sufficiently reduce current water consumption, water available for later supply may be of a quality that may cause damage to property; and
- ▶ any other relevant consideration.

At any time, the ACT Government retains a discretion to declare a State of Emergency under the Emergency Management Act under which supply and/or use of water may be restricted to Emergency Use Only.

Notes

1. This scheme applies to water drawn from ACTEW Corporation's potable water supply system only.
2. "Potable water" means water within the health and aesthetic values set out in the Australian Drinking Water Guidelines issued from time to time by the National Health and Medical Research Council and the Agriculture and Resource Management Council of Australia and New Zealand.
3. Indicative storage levels at which each Stage of restrictions may be introduced are: 55 per cent for Stage 1; 45 per cent for Stage 2; 40 per cent for Stage 3; 35 per cent for Stage 4 and 30 per cent for Stage 5. However, other considerations such as water quality or likely rates of future catchment inflow or infrastructure/equipment problems may warrant the introduction of a particular Stage of restrictions notwithstanding that actual storage levels are above these indicative levels.
4. The "odds and evens" system means that, if your street number ends in an odd number (i.e. 1, 3, 5, 7 or 9), you can only water on days when the date also ends in an odd number. Similarly, if your street number ends in an even number (i.e. 0, 2, 4, 6 or 8) then you can only water on days when the date also ends in an even number – except for 31st day of any month (bonus day).
5. "Private" includes residential, business and Government and non-Government institutions.
6. "Public" includes government and private places operated for public use.
7. ACTEW may, whether on application or of its own initiative, grant exemptions or partial exemptions to a specified class of customers, or to all customers, and such exemptions may be expressed to operate for the whole period during which a Stage is in force or only for a specified period. In particular, ACTEW may grant exemptions under this Note where it considers it desirable to do so to facilitate transition from one Stage of restrictions to another Stage of restrictions. Where exemptions are granted under this Note, ACTEW shall publish notice of that grant in a daily newspaper circulating in the ACT or otherwise directly notify members of a class of affected customers.
8. Where customers can demonstrate serious detriment from application of restrictions, application can be made for an exemption or partial exemption. Applications for exemption must be made in writing and addressed to "Restriction Exemptions", ACTEW Corporation Limited, GPO Box 366, Canberra, ACT 2601. Exemptions or partial exemptions will only be granted in writing. Applications should include a statement of the reasons why an exemption or partial exemption is sought and set out, in particular, what serious detriment is claimed will be incurred if the application is not granted. Without limiting the grounds on which ACTEW might grant an exemption or partial exemption, applications may be granted where there is a compelling health or public hygiene reason or where compliance with restrictions would be likely to cause disproportionate or unintended financial damage to the applicant.
9. Summer means the months of December, January and February; Winter is the months of June, July and August; Spring/Autumn is the months of September, October, November, March and April, May.

ENGLISH	If you need interpreting help, telephone:
ARABIC	إذا احتجت لمساعدة في الترجمة الشفوية، إتصل برقم الهاتف:
CHINESE	如果你需要传译员的帮助，请打电话:
CROATIAN	Ako trebate pomoć tumača telefonirajte:
GREEK	Αν χρειάζεστε διερμηνεία τηλεφωνήστε στο
ITALIAN	Se avete bisogno di un interprete, telefonate al numero:
MALTESE	Jekk għandek bżonn l-għajjnuna t'interpretu, ċempel:
PERSIAN	اگر به ترجمه شفاهی احتیاج دارید به این شماره تلفن کنید:
PORTUGUESE	Se você precisar da ajuda de um intérprete, telefone:
SERBIAN	Ako vam je potrebna pomoć prevodioca telefoniрајте.
SPANISH	Si necesita la asistencia de un intérprete, llame al:
TURKISH	Tercümana ihtiyacınız varsa lütfen telefon ediniz:
VIETNAMESE	Nếu bạn cần một người thông-ngôn-hãy gọi điện-thoại:

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Securing our water supply for the future

During the bushfires, almost all of the vegetation was burnt in the Cotter catchment. Heavy rain washed ash and debris left after the fires, as well as large amounts of soil, into the dams. This caused a temporary increase in turbidity levels, that is, the amount of clay and other material suspended in the water, making it look murky.

The impact of the bushfires is not something that will be resolved quickly. The vegetation in the catchments will take a long time to recover, and water quality in the Cotter catchment dams is likely to be affected at regular intervals for many years.

The best way to ensure that we can make full use of the Cotter dams is to provide facilities to filter the water from Bendora Dam. At present, ACTEW Corporation is refurbishing a decommissioned water treatment plant at Mount Stromlo, and expects that a limited amount of treated water from Bendora Dam may be available for supply in October this year.

In the longer term, ACTEW Corporation will build a new water treatment plant at Mount Stromlo that will provide Canberra with ample capacity to treat and deliver all available water from Bendora Dam. It is expected that this new facility will be commissioned in November 2004.

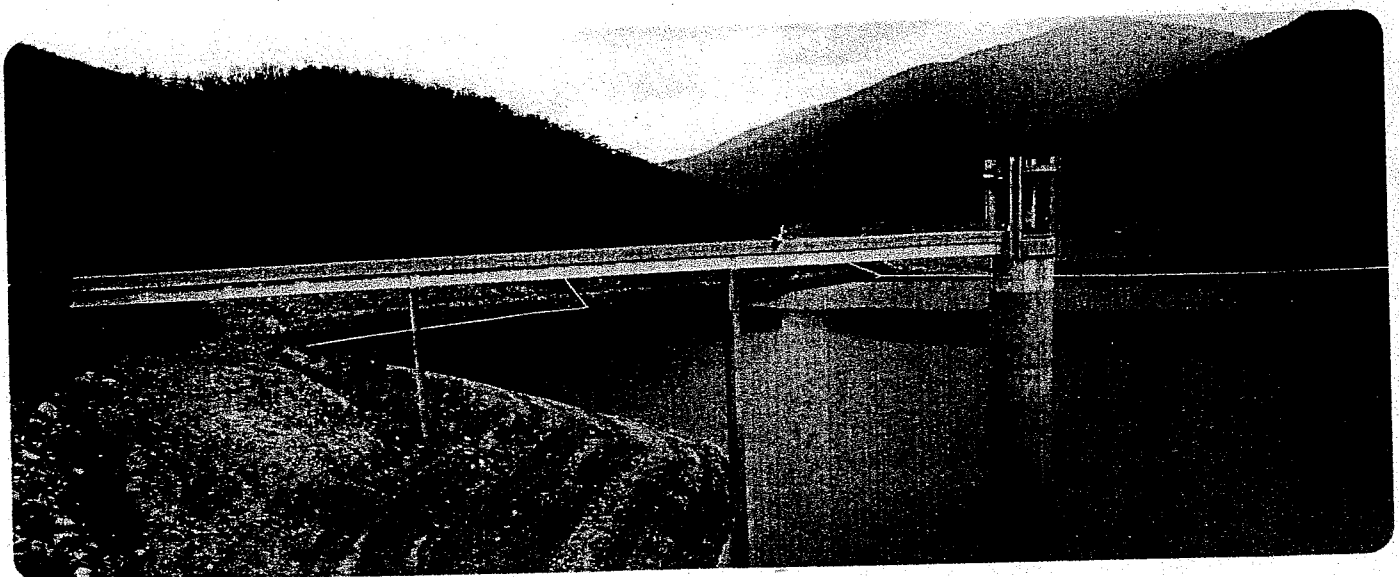
ACTEW Corporation is also expanding the filtration capacity of the Googong Water Treatment Plant from the current maximum of 180 million litres per day to 270 million litres per day.

Using the water in Bendora Dam

All water supplied by ACTEW Corporation is closely monitored in accordance with the Drinking Water Quality Code of Practice. The water is monitored in the dams, at water treatment plants, in town reservoirs above the suburbs of Canberra, and at representative taps around Canberra.

Water in Bendora Dam has been monitored constantly since it was isolated from the water supply in April because of silt and ash washed in by a heavy storm. Water quality in Bendora Dam has been steadily improving and ACTEW Corporation is preparing to switch the supply back on when the water quality is safe to supply. All water supplied from Bendora Dam will be disinfected at the Mount Stromlo Water Treatment Plant and will always be safe to drink.

The Cotter catchment does remain in a vulnerable situation because of limited regrowth since the bushfires, and the area is still susceptible to erosion during severe weather. Monitoring at the dam will continue.



Corin Dam water level in July 2003

Water restrictions scheme

Water Restrictions Authority @ ACTEW, SA, VIC, NSW, QLD, WA

ATTN: Paul Baxter, ICRC

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The mandatory water restrictions scheme has five stages that apply to water use to ensure sustainability of the water supply. These restrictions are compulsory and enforceable. If the ACT moves from one stage of water restrictions to another, the ACT Government will publicly announce the change. Phone ACTEW on 6248 8131 or visit www.water.act.gov.au if you need to check what stage of mandatory water restrictions now apply. For up to date information on dam levels visit www.actew.com.au

	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
Target average daily consumption (Megalitres per day)	Summer: 278 Spring/Autumn: 175 Winter: 116	Summer: 230 Spring/Autumn: 157 Winter: 111	Summer: 197 Spring/Autumn: 127 Winter: 101	Summer: 104 Spring/Autumn: 99 Winter: 85	Summer: 88 Spring/Autumn: 88 Winter: 78
Target annual reduction	15 per cent	25 per cent	40 per cent	55 per cent	60 per cent
Private gardens and lawns, commercial nurseries and turf-growers	Summer and Spring/Autumn: Sprinkler systems from midnight to 7am and 7pm to midnight on alternate days as per the "odds and evens" system. Winter: Sprinkler systems from 7am to 10am and 7pm to 10pm on alternate days as per the "odds and evens" system. Hand held hoses and buckets anytime.	Summer, Spring/Autumn and Winter: Sprinkler systems from 7am to 10am and 7pm to 10pm on alternate days as per the "odds and evens" system. Hand held hoses and buckets anytime.	No sprinklers. Summer, Spring/Autumn and Winter: Hand held hoses and buckets from 7am to 10am and 7pm to 10pm on alternate days as per the "odds and evens" system.	No sprinklers. Watering of lawns not permitted. Summer, Spring/Autumn and Winter: Hand held hoses and buckets from 7am to 10am and 7pm to 10pm on alternate days as per the "odds and evens" system.	No external watering. (recycled water permitted).
Private ponds and garden fountains	Fountains to be switched off unless they re-cycle water. Small ornamental ponds may be topped up by hand held hose or bucket.	Fountains to be switched off. Small ornamental ponds may be topped up by hand held hose or bucket.	Fountains to be switched off. Ponds that support fish or birds may be topped up by bucket directly filled from a tap but not a hose.	Fountains to be switched off. Ponds that support fish or birds may be topped up by bucket directly filled from a tap but not a hose.	Fountains to be switched off. Ponds that support fish or birds may be topped up by bucket directly filled from a tap but not a hose.
Lawns and plants at parks, sports amenities, golf courses and public gardens	The target of a 15 per cent reduction in water use should be met. Hand held hoses can be used at any time.	The target of a 25 per cent reduction in water use should be met. Hand held hoses can be used at any time.	The target of a 40 per cent reduction in water use should be met. Hand held hoses can be used at any time.	The target of a 55 per cent reduction in water use should be met. Hand held hoses can be used at any time.	No watering without prior written exemption.
Paved areas, including street-cleaning	Water must not be used to clean paved area unless cleaning required as a result of accident, fire, health hazard or other emergency.	Water must not be used to clean paved area unless cleaning required as a result of accident, fire, health hazard or other emergency.	Water must not be used to clean paved area unless cleaning required as a result of accident, fire, health hazard or other emergency.	Water must not be used to clean paved area unless cleaning required as a result of accident, fire, health hazard or other emergency.	Water must not be used to clean paved area unless cleaning required as a result of accident, fire, health hazard or other emergency.
Public swimming pools	Existing pool must not be either emptied or refilled without written exemption or may be topped up.	Existing pool must not be either emptied or refilled without written exemption but may be topped up.	Existing pool must not be either emptied or refilled without written exemption but may be topped up.	Pools may not be filled or topped up without written exemption.	Pools may not be filled or topped up without written exemption.

<p>Private swimming pools and external spas</p>	<p>Any pool not previously filled must not be filled without written exemption.</p>	<p>Any pool not previously filled must not be filled without written exemption.</p>	<p>Any pool not previously filled must not be filled without written exemption.</p>	<p>Any pool not previously filled must not be filled without written exemption.</p>
<p>Existing pool must not be either emptied or refilled without written exemption. Pools may be topped up with a hand held hose. Any pool not previously filled must not be filled without written exemption.</p>	<p>Existing pool must not be either emptied or refilled without written exemption. Pools may be topped up with a hand held hose. Any pool not previously filled must not be filled without written exemption.</p>	<p>Existing pool must not be either emptied or refilled without written exemption. Pools may be topped up with a hand held hose. Any pool not previously filled must not be filled without written exemption.</p>	<p>Existing pool must not be either emptied or refilled without written exemption. Pools may be topped up with a hand held hose. Any pool not previously filled must not be filled without written exemption.</p>	<p>Existing pool must not be either emptied or refilled without written exemption. Pools may be topped up with a hand held hose. Any pool not previously filled must not be filled without written exemption.</p>
<p>Public ponds and fountains</p>	<p>A fountain that does not recycle water must not be operated or topped up. Ponds and fountains previously used that do recycle water may be operated but not topped up. Must not be filled or topped up other than by recycled or non-potable water.</p>	<p>A fountain that does not recycle water must not be operated or topped up. Ponds and fountains previously used that do recycle water may be operated but not topped up. Must not be filled or topped up other than by recycled or non-potable water.</p>	<p>A fountain that does not recycle water must not be operated or topped up. Ponds and fountains previously used that do recycle water may be operated but not topped up. Must not be filled or topped up other than by recycled or non-potable water.</p>	<p>A fountain that does not recycle water must not be operated or topped up. Ponds and fountains previously used that do recycle water may be operated but not topped up. Must not be filled or topped up other than by recycled or non-potable water.</p>
<p>Water storage tanks, dams, lakes and large ornamental ponds</p>	<p>Bucket filled directly from a tap or trigger hose used to rinse the vehicle after it has been washed. No restrictions on commercial car wash.</p>	<p>Bucket filled directly from a tap or trigger hose used to rinse the vehicle after it has been washed. No restrictions on commercial car wash.</p>	<p>Bucket filled directly from a tap or trigger hose used to rinse the vehicle after it has been washed. No restrictions on commercial car wash.</p>	<p>Bucket filled directly from a tap or trigger hose used to rinse the vehicle after it has been washed. No restrictions on commercial car wash.</p>
<p>Motor vehicle washing</p>	<p>No washing except by commercial car wash that recycles water and holds an exemption allowing use of potable water.</p>	<p>No washing except by commercial car wash that recycles water and holds an exemption allowing use of potable water.</p>	<p>No washing except by commercial car wash that recycles water and holds an exemption allowing use of potable water.</p>	<p>No washing except by commercial car wash that recycles water and holds an exemption allowing use of potable water.</p>
<p>Window and building washing</p>	<p>No washing unless cleaning is required as a result of accident, fire, health hazard or other emergency.</p>	<p>No washing unless cleaning is required as a result of accident, fire, health hazard or other emergency.</p>	<p>No washing unless cleaning is required as a result of accident, fire, health hazard or other emergency.</p>	<p>No washing unless cleaning is required as a result of accident, fire, health hazard or other emergency.</p>
<p>Commercial construction and related activities</p>	<p>Unless otherwise exempted in writing water must not be used unless by means of a trigger hose. Wherever possible non-potable water should be used.</p>	<p>Unless otherwise exempted in writing water must not be used unless by means of a trigger hose. Wherever possible non-potable water should be used.</p>	<p>Unless otherwise exempted in writing water must not be used unless by means of a trigger hose. Wherever possible non-potable water should be used.</p>	<p>Unless otherwise exempted in writing water must not be used unless by means of a trigger hose. Wherever possible non-potable water should be used.</p>

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Statistics

Statistics

	2001-02	2002-03	2003-04	2004-05	percentage change	2005-06
Financial performance (\$'000)						
Total revenue	488,153	487,008	547,066	568,195	+1.3%	575,744
Operating profit before income tax	82,609	85,179	102,616	104,699	-0.4%	104,271
Income tax	52	38	139	(701)	+177.9%	546
Operating profit after tax	82,557	85,141	102,477	103,998	+0.8%	104,817
Distributions to partners	113,000	97,000	96,000	97,000	-7.2%	90,000
Financial position (\$'000)						
Current assets	129,928	108,354	125,672	120,650	+6.7%	128,716
Non-current assets	734,473	744,979	748,101	766,325	+1.0%	774,153
Total assets	864,401	853,333	873,773	886,975	+1.8%	902,869
Current liabilities	100,561	98,653	110,992	115,722	+13.1%	130,864
Non-current liabilities	12,649	15,348	16,983	18,457	-76.3%	4,378
Joint venture funds	751,191	739,332	745,798	752,796	+2.0%	767,627

Sewerage

	2001-02	2002-03	2003-04	2004-05	percentage change	2005-06
Customers accounts	123,641	125,784	128,446	130,355	+2.2%	133,217
Number of pumping stations	28	28	26	26	+3.8%	27
Quantity of sewage treated (ML)*	30,645	28,313	27,959	27,293	+6.3%	29,019
Maximum daily load (ML)	190.6	116	111.35	113	+35%	153
Sewage treated per person per annum (kL)	97.6	89.2	86.6	83.5	+5.4%	88
Length of mains (km)	2,875	2,897	2,921	2,948	+1.3%	2,985

* Figure represents outflow from LMWQCC.

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STATES AND TERRITORIES, State households, selected household characteristics

		NSW	Vic.	Qld	SA	WA	Tas.	NT(a)	ACT	Aust.
PROPORTION OF HOUSEHOLDS WITH CHARACTERISTIC										
Tenure and landlord type										
Owner without a mortgage	%	35.4	38.9	31.6	34.9	31.2	38.4	17.1	31.8	34.9
Owner with a mortgage	%	33.2	36.4	33.8	37.6	38.1	33.8	42.1	35.8	35.1
Renter										
State/territory housing authority	%	5.1	3.7	4.3	7.8	4.0	7.1	10.6	9.2	4.9
Private landlord	%	22.4	17.9	25.6	16.2	21.9	16.4	20.9	19.8	21.2
Total renters(b)	%	29.3	22.3	31.7	25.8	27.7	25.6	35.9	30.7	27.6
All households(c)	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Family composition of household										
One family households										
Couple family with dependent children	%	27.9	28.3	25.6	24.3	26.7	25.3	29.6	27.9	27.1
One parent family with dependent children	%	6.5	6.5	7.1	6.3	7.6	8.4	9.0	7.5	6.8
Couple only	%	25.4	25.1	27.8	27.5	25.9	28.1	21.0	25.7	26.1
Other one family households	%	12.7	10.0	8.2	9.1	10.4	7.7	9.9	7.0	10.4
Multiple family households	%	1.5	1.0	*0.8	*0.7	*0.7	**0.2	*1.1	np	1.0
Non-family households										
Lone person	%	22.8	25.8	26.5	29.7	25.7	28.1	25.9	27.3	25.4
Group households	%	3.0	3.3	4.0	2.4	3.0	2.2	*3.5	4.6	3.2
All households	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dwelling structure										
Separate house	%	76.6	80.3	82.1	81.8	83.5	88.1	74.0	77.7	80.0
Semi-detached/row or terrace house/townhouse	%	7.6	9.2	5.1	12.0	12.5	5.3	*7.5	10.6	8.3
Flat/unit/apartment	%	15.4	10.3	11.8	5.6	3.5	6.2	18.1	11.2	11.2
All households(d)	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Housing costs as a proportion of gross income										
25% or less	%	75.3	79.3	77.3	81.8	79.2	88.0	78.1	77.0	77.9
More than 25% to 30%	%	7.1	5.6	5.8	6.4	6.7	4.6	9.7	10.5	6.4
More than 30% to 50%	%	11.9	10.1	10.9	8.9	9.8	5.7	9.3	9.1	10.6
More than 50%(e)	%	5.8	5.1	6.1	2.9	4.3	*1.7	*3.0	*3.4	5.1
All households	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Equivalised disposable household income(f)										
Lowest quintile	%	24.3	24.1	26.6	25.2	23.1	29.2	14.6	16.6	24.6
Second quintile	%	17.1	19.3	18.4	22.1	20.0	24.8	10.5	9.3	18.6
Third quintile	%	16.5	17.3	19.3	20.0	18.6	18.1	16.2	19.1	17.8
Fourth quintile	%	19.3	18.2	18.3	15.6	18.9	15.0	22.6	20.7	18.4
Highest quintile	%	22.8	21.1	17.4	17.0	19.4	12.9	36.1	34.3	20.6
Second and third deciles	%	20.0	19.0	22.8	23.6	21.1	23.6	9.2	11.6	20.6
All households	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of employed persons										
None	%	30.4	29.9	31.1	34.8	27.5	36.6	14.6	24.7	30.4
One	%	28.5	30.7	29.9	29.8	33.4	30.8	37.9	29.9	30.0
Two	%	30.4	29.0	30.1	25.6	28.9	25.9	36.1	34.7	29.5
Three or more	%	10.7	10.5	8.9	9.7	10.2	6.7	11.4	10.7	10.1
All households	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Estimated number of households	'000	2 523.5	1 906.0	1 526.4	626.5	770.5	198.2	56.2	128.7	7 735.8
Average number of persons in household	no.	2.62	2.56	2.47	2.40	2.51	2.39	2.59	2.45	2.53
Average number of bedrooms in dwelling	no.	3.02	2.97	3.02	2.93	3.25	2.93	2.87	3.15	3.02
Number of households in sample	no.	2 630	2 386	1 996	1 257	1 440	823	422	407	11 361

* estimate has a relative standard error of 25% to 50% and should be used with caution

** estimate has a relative standard error greater than 50% and is considered too unreliable for general use

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Excludes households in collection districts defined as very remote or Indigenous Communities, accounting for about 23% of the population in the Northern Territory.

(b) Includes other landlord type.

(c) Includes other tenure type.

(d) Includes other dwelling types.

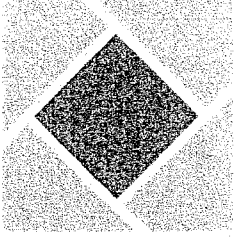
(e) Includes households with nil or negative total income.

(f) See paragraphs 35 to 40 of the explanatory notes.

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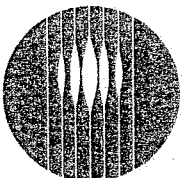
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Applied Social, Systems and
Economics Research Team

Division of Water
Resources WA
Institute of Natural
Resources &
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The Water Future of the ACT

A Community Discussion Document on the Major Issues



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Consultancy Report No. 92/45

The Water Future of the ACT

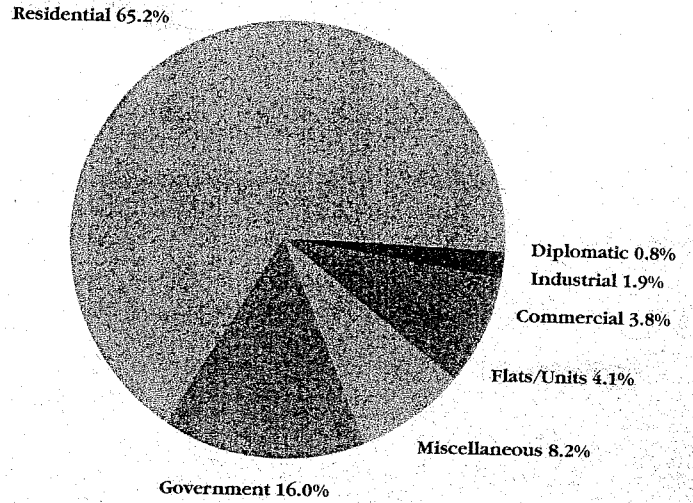
A Community Discussion

Document on the Major Issues

Prepared for ACTEW
by
CSIRO ASSERT Social Science Unit
Division of Water Resources

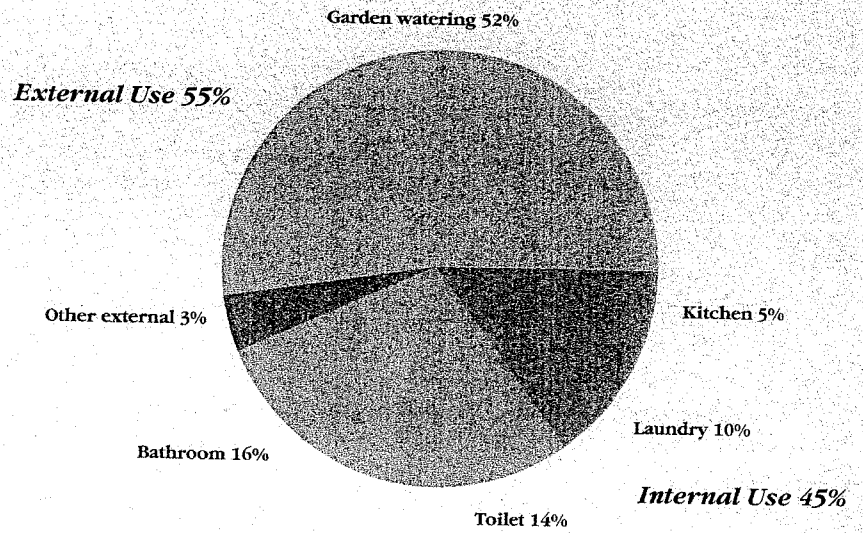
December 1992

Figure 3: Users of treated water in the ACT, 1983-1986



Source: National Capital Development Commission (1989)

Figure 4: Types of treated water use in Canberra homes



Source: National Capital Development Commission (1989)

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