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ENVIRONMENT, COMMUNICATIONS, INFORMATION
TECHNOLOGY AND THE ARTS REFERENCES COMMITTEE

(SUBCOMMITTEE)

Reference: Australia's urban water management

THURSDAY, 23 MAY 2002

CANBERRA

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SENATE
ENVIRONMENT, COMMUNICATIONS, INFORMATION TECHNOLOGY
AND THE ARTS REFERENCES COMMITTEE

Thursday, 23 May 2002

Members: Senator Allison (*Chair*), Senator Tchen (*Deputy Chair*), Senators Lundy, Mackay, McLucas and Tierney

Participating members: Senators Abetz, Bolkus, Boswell, Brown, Buckland, Calvert, George Campbell, Carr, Chapman, Conroy, Coonan, Crane, Eggleston, Evans, Faulkner, Ferguson, Ferris, Harris, Knowles, Mason, McGauran, Murphy, Payne and Watson

Senators in attendance: Senators Tchen and Tierney

Terms of reference for the inquiry:

For inquiry into and report on:

- a) The management of water in Australian cities including:
 - i. a review of existing reports on the management of water, predominantly in urban areas, and
 - ii. an assessment of what constitutes ecologically sustainable water use and the environmental, health and economic implications and imperatives for achieving this, taking into account:
 - (A) projected population growth and consumption rates,
 - (B) water quality and adequacy,
 - (C) urban planning, and
 - (D) water management systems;
- b) The progress and adequacy of Australia's policies to reduce urban water use and improve water quality;
- c) Environmental performance in urban stormwater management, including:
 - i. effects of accelerated run-off from sealed urban catchments on waterways,
 - ii. the impact of urban run-off on receiving waters,
 - iii. best environmental practice in urban stormwater management, and
 - iv. clarification of roles, responsibilities and reporting requirements amongst public agencies at state and local government level; and
- d) the potential for Australia to improve water quality and environmental outcomes, including:
 - i. the opportunities, constraints and costs of:
 - (A) waste water recycling, grey water use and urban stormwater utilisation, and
 - (B) improved water use efficiency in household, garden, public open space and industrial contexts demand management,
 - ii. the effectiveness of applying financial, market and other mechanisms to achieve water efficiency,
 - iii. the effectiveness and relevance of environmental management systems, certification programs and best management practices, and
 - iv. the introduction of bulk water entitlements and water markets, and their implications for urban and industrial water consumption.

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ACTING CHAIR (Senator Tchen)—I declare open this public hearing of a subcommittee of the Senate Environment, Communications, Information Technology and the Arts References Committee inquiring into urban water management and welcome everyone here today. This hearing in Canberra is the eighth hearing of the committee's program of hearings around the country in relation to this important inquiry. We held our first meeting in Canberra on 22 March, and since then have had hearings in and undertaken site visits in Townsville, Brisbane, Sydney, Melbourne, Perth and Adelaide. I am sure that we will find today's discussion—the final in our planned program—equally useful. I should state at the outset that the committee has agreed that its current reporting date of 27 June is unrealistic and too tight for us to do justice in our report to the sheer volume and complexity of the evidence that we have received. We are planning to ask the Senate for an extension of our reporting date to 29 August.

I welcome the representatives of the ACT government and ACTEW Corporation. The committee has published a submission received last month from Mr Bill Wood MLA, ACT Minister for Urban Services. On the committee's behalf, I record our appreciation of Mr Wood's cooperation with this inquiry. I should say that in August last year, before the election, officials from ACTEW Corporation took Senator Allison and me on an inspection tour of several of Canberra's water treatment facilities, which, for us, was a very valuable introduction to some of the key concepts we have encountered during this inquiry.

The committee prefers all evidence to be given in public, but should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private you may ask to do so and we will consider your request. Finally, as you are officers of territory government agencies, I point out that you will not be expected to answer questions which invite you to express a personal opinion on matters of policy and that you will be given reasonable opportunity to refer questions to superior officers or to a minister. I now invite you to make an opening statement before we move to questions.

Ms Fowler—Thank you, Senator. I will give a brief opening statement and then will take any questions on which you require clarification. I thank the committee for giving the ACT the opportunity to provide our views on urban water management. The ACT has a long history of innovative and effective urban water resources management. Water has always been recognised

as a valuable resource in the ACT. One of the main criteria in selecting the site for the national capital was that there should be an ample supply of high quality water. ACT water policy operates in both a national and a territory framework. We recognise our position as being wholly contained within the Murray-Darling Basin, being by far the largest inland city in Australia, and the potential impacts that we could have on downstream waters and their users.

The ACT has a current population of around 310,000. The ACT supplies bulk water to the New South Wales city of Queanbeyan, which has a population of around 30,000. On the basis of current per capita consumption and environmental flow requirements, the currently developed resources can accommodate growth in the ACT population to around 405,000.

The ACT is committed to the COAG water reforms. We believe they are important in progressing sustainable urban water management. In its assessment for second tranche payments, the National Competition Council commented that the ACT was the only jurisdiction that had complied fully with the reforms. The reforms require commitment to the National Water Quality Management Strategy, which includes the Australian and New Zealand guidelines for fresh and marine water quality. These guidelines provide the necessary framework for water quality assessment and management. Consistent with these guidelines, the ACT has pioneered an integrated catchment approach to land use planning in a predominantly urban area, linking downstream water quality with land use management and guiding the city's layout from single block to city-wide consideration of stormwater. As a result, the ACT has instigated an integrated system of water supply, waste water treatment, stormwater management and at-source controls which protect downstream waters, particularly the Murrumbidgee River, delivering water quality and flow regimes which approximate predevelopment conditions.

While a range of government agencies have responsibilities which have an impact on water management, the critical factor is that there are strong partnerships and links between the different interests. That is why several of us are here today. In the ACT, responsibilities are as follows: Environment ACT has responsibility for resource management and environment protection, Urban Services for stormwater, Planning and Land Management for urban design, ACTEW Corporation for water supply and sewerage services, Treasury for utility regulation and pricing, and Health and Community Care for regulating drinking water quality.

In addition, the ACT is one of the foundation partners of the Cooperative Research Centre for Freshwater Ecology, from where we obtain much of our scientific advice, which is critical in underpinning management decisions. In terms of regional cooperation, as I said before, we participate in the Murray-Darling Basin Commission and other cross-border initiatives. Most importantly, we see community partnerships as essential in working towards sustainable water management.

Within this policy context, some of the ACT's water achievements have been to focus on the following objectives: ensuring that water quality is suitable for desired uses and environmental values; minimising the impacts of water diversion on the water supply catchment; minimising the impacts of discharging treated effluent; improving the efficiency of water use, including cost-reflective pricing and reuse; minimising public health risks; minimising infrastructure costs; maximising the amenity and recreational benefits provided by water-dependent ecosystems; and maximising the returns to the community on the value of this valuable resource.

The ACT can claim considerable successes in achieving these objectives. More than 20 years ago and in light of deteriorating water quality in the Murrumbidgee River, a comprehensive catchment study was undertaken. Water quality objectives were determined, and an integrated strategy to meet those objectives was put in place. Major elements of this strategy included the commissioning, in 1978, of an advanced tertiary treatment plant which treats most of Canberra's sewage through a continual process of modification and upgrade to ensure optimal plant performance. This plant remains at the forefront of sewage treatment. Controls were placed on pollution discharges. The most pressing area was sediment transport from land development and building sites. In 1984, Canberra pioneered erosion and sediment control requirements on such sites which are now commonplace across the country. A comprehensive approach to stormwater management was implemented through stormwater flows, which are managed through a system of vegetated floodways incorporated as urban open space, gross pollutant traps, wetlands, ponds and lakes.

More recently, our attention has been focused on reducing the impacts of water diversion from water supply catchments and ensuring the returns to the community on the use of this valuable resource are optimised. In this context and consistent with COAG water reforms, the ACT has put in place a comprehensive environmental flow regime covering all waters under the control of the territory executive. While the implementation of this flow regime involves an increase in treatment costs for the ACT, it ensures the protection of significant environmental values in the Cotter River catchment including a number of threatened fish species. The ACT has also used its partnership in the CRC for Freshwater Ecology to instigate a major study into environmental flows to ensure that, in the long term, the environmental flows are appropriate.

Also consistent with COAG reforms, measures have been put in place to promote the efficient use of resources and reduce impacts on water supply catchments. For instance, as part of the future water supply strategy initiated by ACTEW in 1993, the ACT was the first jurisdiction to implement a two-part pricing regime for urban water, which was not tied to land values—that is, a fixed component reflected capital costs and a volumetric component reflected operational costs. A water abstraction charge on all water use has also been implemented, which ensures that all costs of water supply and use are faced by consumers. This charge covers catchment management costs, a component to reflect scarcity of water and a component for environmental costs.

The ACT has also made significant progress on reuse initiatives. I understand that some members visited the Southwell Park water mining facility last year. There is a rebate scheme in place for householders who install rainwater tanks, and losses from the water supply network are minimal. Since 1993, these measures have resulted in a 20 per cent decrease in water use. Underpinning the ACT approach is the extensive monitoring used to assess the effectiveness of measures. In partnership with the CRC for Freshwater Ecology, we have data and research results to demonstrate our successes. The ACT also formally regulates drinking water quality through the adoption of national drinking water quality guidelines and a drinking water code of practice. Finally, utility regulation through the Independent Competition and Regulatory Commission and the Essential Services Consumer Council ensures that public interest is protected.

While the ACT is proud of its achievements, there is further work to be done. There is community pressure in the ACT to improve the recreational amenity of our lakes and to

reintroduce ecological values into local neighbourhood waterways. As population growth continues, the ACT will either need to develop new resources through another dam, with the consequent environmental and cost impacts, or make better use of the resources that are currently available. While we have made significant gains in reducing the demand on potable water supplies, we still see this as an urgent need to greatly reduce per capita use.

Finally, water supply, waste water and stormwater infrastructure are expensive to provide and maintain, and we must find more efficient ways of managing water so as to reduce costs. In the ACT, Canberra, like other cities, particularly to our knowledge Melbourne, Brisbane and Adelaide, is moving along the lines of water sensitive urban design. An important element of this approach is, rather than treating stormwater and waste water as waste products to be removed from the urban area as quickly as possible, treating stormwater and waste water as resources that can supplement potable water supplies, enhance urban forms and landscapes, support the reintroduction of ecological values into the urban area and reduce infrastructure costs. The potential benefits of this approach, which essentially entails slowing down the movement of water through the landscape combined with efficient use of resources, are now well understood.

I have mentioned the Cooperative Research Centre for Freshwater Ecology. Another CRC on catchment hydrology has also produced valuable new approaches in this area. However, the uptake of new approaches is being hampered by a number of factors: the lack of practical examples in a variety of circumstances, which demonstrates the need for sharing of knowledge and experiences; the unavailability of suitable products, including technical guidelines for their application; insufficient technical knowledge and awareness by practitioners; the need for greater consideration of water in the initial stages of land planning and development; and, despite the COAG water reforms, the continued underpricing of water across Australia which discourages investment in more sustainable approaches, public awareness and acceptance of new approaches, and the need for regulation to keep pace with new developments. We are of the view that efforts to slow down the run-off from urban areas, to utilise it on-site as a resource and to make efficient use of and have realistic pricing of water supplies are essential to move toward sustainable urban water management.

We are conscious that, with the ACT's population increases, the imperative to get more out of the use of existing developed resources will become more pressing. At the same time, we need to maintain security of supply, public health protection and environmental flows. While we have a robust regulatory framework, our real successes stem from a strong commitment to sound environmental performance which has progressed through partnerships amongst regulators, service providers and the community, rather than by just focusing on technical compliance. That is a brief overview of how we operate in the ACT. We welcome your questions, if you require clarification.

CHAIR—Thank you.

Senator TIERNEY—Canberra is a modern city. We have been looking at a lot of other cities around Australia that are now suffering from earlier styles of engineering, which Canberra is not facing to the same extent. On the area of stormwater management, we found major problems right across the country in the major cities. With the proliferation of different authorities who controlled the assets, some of them did not even know where the assets were,

let alone what state they were in. In relation to stormwater management, most of what has happened here was developed in the fifties, I assume. Could you give us a clearer picture of stormwater management around the capital and whether you have any lessons for other parts of Australia? Given that it was built in the fifties, as I am assuming, what have you had to do to upgrade your stormwater management assets?

Mr Wilkinson—Much of the real growth in the ACT occurred through the sixties and seventies. It was basically in the seventies when the impact of Canberra on the Murrumbidgee started to become apparent. We were fortunate at the time because the place was small and it had that centralised planning authority. Water was considered fairly integral to the development of the national capital and there was basically a broad catchment wide study undertaken to determine what should be our water quality objectives and how to achieve them. There was, even then, quite an integrated strategy approach. Lower Molonglo went in for sewerage. In terms of stormwater, they looked at at-source controls, like the erosion sediment controls we mentioned, and we also started to develop the system of urban lakes, ponds and wetlands. That was quite successful in reducing the impact on the Murrumbidgee. The flows and quality are somewhat akin to pre-urban development. Nevertheless, there are quite a few things which were done then which we really need to improve. We focussed on getting the stormwater away from the single blocks. We put in the big infrastructure that stopped that impacting on the Murrumbidgee but, in terms of the local neighbourhood issues, it was still the traditional approach where you tended to concentrate on conveying it out of the area.

We have come to realise—and we now have a community sentiment—and we also have research results from the Cooperative Research Centre for Freshwater Ecology which demonstrate that, with the neighbourhood level, we will have to do better to achieve more sustainable results. You can still see around the older areas of Canberra big concrete drains. They focus on getting the water away from the urban area. If we can slow that down, we will have opportunities to reduce the water quality impacts on our lakes and make them more attractive for recreational activities, et cetera. We have the capacity to pull ecological values up into the urban area, along naturalised stream channels. The other big focus is the possibility of using stormwater as a resource on site to supplement potable water resources. Canberra is quite well endowed at the moment with water resources, but within about another 15 years, at the current rate of use, we will come to the end of currently developed resources. We will either build new dams, which is pretty difficult in the Murray-Darling Basin, or do a lot better with what we have. That is why our focus is now on urban stormwater management—making use of it as a resource and, at the same time, reducing the impacts on our urban lakes and improving management in the local area.

Mr Dymke—Most of the pipe network systems we have in the ACT, until about 1960, were developed to about 10 per cent of their current status. Between 1960 and 1985, the remaining 80 per cent of those networks were constructed. So they have been constructed over a very short period of time, probably in a slightly different way from most other states. The water and sewerage networks and also the stormwater networks were constructed by contract rather than by day labour. Melbourne and Sydney had massive organisations in the Sydney Water Board and the Melbourne Water Board, and they did most of their own urban construction, whereas in the ACT, through the National Capital Authority, which operated during that time, and the NCDC, most of the construction was undertaken by contractors. That is good and bad. Probably the quality of the assets that developed from that process in the ACT was slightly inferior to the

quality of assets that were built in Melbourne and Sydney using day labour resources. That is the sort of trade-off that was done. ActewAGL now does the maintenance for the Department of Urban Services on the ACT stormwater network.

Senator TIERNEY—So it is all under your control, the total stormwater?

Mr Dymke—We do not own the assets—

Senator TIERNEY—No, but in terms of managing—

Mr Dymke—but we deal with all of the operations and maintenance on all three networks at the present time.

Senator TIERNEY—That gives you a huge advantage over the rest of the country in terms of managing that. To give us some sense of reducing impact on the Murrumbidgee, you mentioned the traditional concrete drain to get water away and you mentioned that there are some other approaches to slow down the movement of water. Could you give us some sense of how far that has gone? Are we still looking at predominantly concrete drains pushing water out into the Murrumbidgee system eventually?

Mr Wilkinson—In terms of impact on the Murrumbidgee, we have done fairly well because water in the urban lakes comes from most of the urban catchment and so they have quite a significant attenuating effect and a good water quality amelioration effect. Downstream of the lakes, we have done pretty well.

Senator TIERNEY—How much gets into these lakes as opposed to going straight into the Murrumbidgee?

Mr Wilkinson—Off the top of my head, I would say 85 per cent goes through that lake system.

Senator TIERNEY—That gives us a sense of the scale.

Mr Wilkinson—Anything that has been built since, basically, the late seventies would be protected by some sort of lake, pond, wetland or something. I am not sure whether you are aware, but some parts of Weston Creek and some small areas of West Belconnen go into the Molonglo river downstream and not into Lake Burley Griffin, so those areas are not protected.

Mr Dymke—Most of the stormwater drains that leave those areas are protected by gross pollutant traps to ensure that we trap the shopping trolleys as well as the plastic bags, and a lot of the largest sediment is trapped in those gross pollutant traps before it reaches the river system. There is a number of those protecting the upstream side of the lakes as well as the downstream, where we do not have a lake system in place. That has been quite effective in terms of removing gross solids, more so than the fine suspension solids.

Senator TIERNEY—There is an attachment to your submission called the *Canberra stormwater management strategy* that referred to a trial swale and infiltration subdivision area

in the ACT. Obviously, the proposal is to stop this water even getting away from the area, let alone treating it in some way. Could you provide us with some information on how that trial has gone and whether you have plans for that sort of approach to managing stormwater in other subdivisions?

Mr Wilkinson—There have been trials on and off in certain places for some time. Some put in in the early eighties were not very good at all. It was mixed up with low cost housing and so forth. The swales were never managed properly and people drove over them and whatever. It just did not work and there was no public information. The current one that we are trying to do a reasonable amount with is east O'Malley, and it is still in the planning stages. It is a fairly difficult site. Nevertheless, we have quite a few innovative measures planned for it, like getting rid of the traditional curb and gutter, using swales and having a sheet overland flow, and so forth. It should be released before the beginning of the next financial year. In general planning development applications, we are starting to incorporate measures right from the land development areas down to the individual blocks. It is a slow process. We have some little bits, but it is basically now a standard requirement in planning and development systems for developers or applicants to demonstrate how they are going to slow down the movement of water off their blocks.

We have a bit of resistance and some difficulties in that we all understand the theory—it is well established—but when we come to put it in place the people who eventually become the asset owners or managers are quite worried about the long-term maintenance implications and the sorts of technical guidelines these things are going to be built to. At the moment it is a bit uncertain for them and they are, quite rightly, a bit reluctant to jump into it. We have little bits in place in various areas now and we are moving towards putting it in place in a far more consistent and widespread manner.

Senator TIERNEY—On the issue of water, in this area you are in a very different situation to everyone else. Most states have vast land areas where they can trap water and pipe it into the city. You are in a very large population with a very small land mass that you control. Could you perhaps paint some sort of picture for the future if this city of 300,000 becomes a city of a million—or whatever your projections are—in the next 60 years? How do you source water in that future?

Mr Wilkinson—We are quite thankful to the founding fathers that the ACT's location was specifically chosen to ensure a good water supply. In addition to the ACT where our major water supplies come from the Cotter River, the Commonwealth was also given paramount rights over the waters of the Queanbeyan River and the Molonglo River in New South Wales. The Queanbeyan River was developed into Googong Dam. In theory, those water resources could keep us going for probably another 15 years. The original intention was that the next source would be in the Gudgenby region, which is in the southern parts of the ACT. That could give us a few more water resources.

In theory, we could be all right for some time, but as we have said, we are in the Murray-Darling Basin. We might be able to physically catch more water up here but we have to take a broader view of what is happening in the basin as a whole. We also have to take account of the environmental impacts of building another dam. That area where the new dam would go is a valued recreational wilderness area. There would be a lot of public opposition to building the

new dam. So, while on one hand we have the physical resource there, we are still subject to the same pressures as everyone else about trying to develop that. We are coming to the realisation that we will probably have to manage within our existing developed resource. So we have that 15 years, which is not very long term in water resource planning, to try and do something different and make a far better use of our existing resource.

Senator TIERNEY—Let us turn to what you are doing to manage demand for water in the area. I am from the Hunter Valley. In Newcastle in the eighties we were the first to get a very brutal price signal to change our wicked ways of water usage, which we all responded to magnificently with the doubling of the price of water within 12 months. I had six children at home and a 50,000-litre swimming pool. We changed the way shower heads worked, we changed the way the flush toilet worked, the pool had to fix itself and so did the lawn. It was called the browning of Newcastle. But they were up to the point of building the next big dam—that is when they did it. That was 17 years ago now and we are still nowhere near having to build a big new dam. Could you explain to us what sort of carrots and sticks you are using in Canberra?

Mr Wijeratne—Can I put something in the context of the water usage in Canberra. In the 1980s, residential usage was 400 kilolitres per annum. In the 1990s, leading up to the mid-1990s, it went down to about 330 kilolitres. In the year 2000, we were using 280 kilolitres per residence. So you can see that it has reduced over the years. John Dymke and John Robertson would also have comments to make on this issue. We have run a fairly vigorous campaign over the last 10 years on public awareness of the value of water. The two-part pricing component that Elizabeth mentioned in her opening statement has had a major effect as well. So, between the pricing and the awareness campaigns, I think we have managed fairly well up until now. The trends are encouraging, and we are also looking at reuse in a significant way in this town—that is, waste water recycling. Given all those contributory factors, hopefully we can stretch out the 15-year estimate a bit longer.

Mr Dymke—In 1993, when we did the future water supply strategy for the ACT, we were looking at building a dam in the period 2005-10, based on water consumption around that time. As a result of the future water supply strategy, changes in water pricing policy in particular, and also general awareness to consumers relating to that—and based on the resources available at that time—we were looking at 2040 before we had to build a new storage facility. So we shifted it quite substantially. The impact of the introduction of mandated environmental flows under the ACT Water Resources Act shifted that timing back 20 years—in other words, back to 2018, 2020—taking into consideration those gains that had been achieved through the reduction in per capita consumption.

Senator TIERNEY—Can you explain environmental flows. Do you mean that you are required to release more water?

Mr Dymke—Yes.

Senator TIERNEY—And that then reduces your storage capacity?

Mr Dymke—That is right. So that had quite a substantial impact, probably a population impact of about 85,000 within the city that we could not serve prior to that time. From what we

can gather, the pricing signal that has come through has probably been the most important issue in reducing the impact of water consumption. It has been sustainable to date. The peak summer demand has dropped by 30 per cent relative to that point in time, which means that there has been a major shift away from irrigation, as household internal usage has not changed dramatically over that period. The introduction of low-flush toilets, from 10- and 12-litre toilets to three- and six-litre toilets, dual flush, has had an impact, and there is the potential to go down even lower to two- and four-litre flush toilets. That will probably be the single biggest issue in reducing per capita consumption inside the house, where you have fairly substantial ongoing usage. The ACT government, with the Master Builders Association, have had a program of subsidising the installation of water-efficient shower roses—and, again, shower roses are probably a very important issue in reducing overall household consumption.

I think the ACT government themselves have taken on some fairly major initiatives in irrigation management within the city to better improve the means of broadacre irrigation. They have certainly dropped the level of irrigation in terms of irrigated area, and the government have also looked at better management systems for irrigation. You have a slightly less green city but also more efficient water use on the areas that are being watered in the city at the moment.

Mr Robertson—Rainwater tanks.

Mr Dymke—Yes. Rainwater tanks have never really been a take-off item in the ACT. We have subsidies—

Senator TIERNEY—People can do that, though.

Mr Dymke—People can do it. We give them a subsidy for installing one. The planning approvals process is quite heavy in terms of getting a rainwater tank approved to put on your block. Also, it does not come without expense, because of the requirement to ensure that there is no interconnection between low-pressure and high-pressure plumbing, where we could have back-flow into the reticulation network, causing a contamination problem. It is not that easy to use a rainwater tank.

Mr Wilkinson—On that issue, I know John Robertson will talk about pricing a bit more, but on the rainwater tanks, as part of water sensitive urban design, we are trying to turn that planning issue around by requiring some form of on-block retention. The stormwater managers wanted what they call ‘detention’, where they would have detention tanks and let the water out and flow down, but we are putting on a requirement for retention. It would be up to developers to work out exactly how, but one means could be landscaping on-site and pervious pavement to reduce run-off. Another way that we try to push a little bit is by incorporating rainwater tanks into the house development itself. It is no good having a tank there that people do not use. It could be plumbed into the system for some use like a toilet, and when it runs out it could be topped up with water supplies. That will be a requirement in this east O’Malley estate, which is just on the southern side. It has traditionally been quite a ritzy development—builders and embassies—but it will be mandated in a large proportion of this new estate that there will be rainwater tanks plumbed in.

Senator TIERNEY—They will have to do that.

Mr Wilkinson—Yes. That is a pilot development, I must admit.

Ms Fowler—But it can be used as a demonstration.

Mr Dymke—We have looked at that issue broadly as well. The use of rainwater tanks is quite substantial in terms of the impact on overall water consumption, particularly if you can defer the use of that water for external irrigation.

Ms Fowler—Mr Robertson could talk about pricing, if you would like some more information on that.

Mr Robertson—The two-part pricing regime we have at the moment has already been mentioned. The volume of water which attracts the lower charge has been gradually reduced over the years. It has been coming down by about 25 kilolitres per annum for a number of years. We are now down to 225 kilolitres, and that process will probably cease when we get to a consumption of 175 kilolitres, as that is seen to be the minimum necessary at this stage, given current technology, for residential use. There is a significant price increase for the kilolitres above the threshold. Those price signals, as you noted in the case of the Hunter, have also been very important here, as Mr Dymke has said.

The other thing the ACT government has done to strengthen those price signals is to introduce a water abstraction charge. The charges that are effectively levied by ACTEW to date have been very cost reflective in that they reflect the operational costs and the capital costs of the water system. The water abstraction charge is something else: it reflects the fact that the community owns the water. In the past, people have been charged for the delivery of water but nothing for the value of the water itself. Hence, the water abstraction charges have broader factors included in its make-up—which Ms Fowler has already mentioned as being a significant element which reflects the scarcity value of water. When that was originally determined, it was based on the value that water was trading at in the Murray-Darling Basin at the time. There is also the environmental cost of water abstraction and the catchment management costs which otherwise were being absorbed by general government and the users were not reflecting those charges.

Senator TIERNEY—Does the effect of that put the price of water, on average, above other capital cities?

Mr Wilkinson—I would say it is not but, taking into account the water supply network in Canberra, we are very fortunate in that lots of it comes from the Cotter River, which is very high quality, so little treatment. It is also gravity delivered, so it is a very good source of water. It is a very cheap and good source of water in terms of natural attributes.

Mr Robertson—A key element of the COAG reforms has been moving towards cost-reflective pricing. Of course, as our operational costs are less than elsewhere, that is happening with our prices.

Mr Wilkinson—We might note, though, that the COAG reforms explicitly include environmental costs, but we are probably the only place that has explicitly included them.

ACTING CHAIR—That is the point I wanted to ask you about. I am afraid we are running to a very tight schedule, and I understand you have an appointment very shortly, too. If the answer is going to be complex, we might make it a question on notice and perhaps you can give us an answer later. You made the point that the ACT is the only one so far to fully comply with the COAG requirements, yet the National Competition Council has commented in relation to urban reform that most jurisdictions have now achieved full cost recovery, which seems to be a bit of a contradiction. You mentioned inputting the cost of the extraction of the water. From my experience in this inquiry, you are the only one to have actually done it as yet. Most other jurisdictions actually have not touched on the issue—the water is just free. Maybe that is what you are referring to. That also comes back to the issue of two-tier water pricing. Again, from my queries of other agencies, they seem to be very uncertain or unclear about how they define the base charge rather than the user-pays charge. I would like you to perhaps give us a more detailed explanation as to how you achieve this structure. If the answer is going to be fairly complex, I am happy for you to take it on notice.

Mr Dymke—We will take it on notice. Basically, the base charge covers the capital cost of the network development that ACTEW has.

ACTING CHAIR—Could you explain how you actually work that in? Obviously the capital costs come in a lump sum and you have a cost over a period.

Mr Dymke—ACTEW will take that on notice.

ACTING CHAIR—Last time we talked to ACTEW we understood there to be a bit of a conflict between the aims of different agencies controlling water flow in the Molonglo River. I understand that ActewAGL has a load based licence to discharge treated effluent into the river, and the licence actually encourages ActewAGL to minimise discharge, whereas you are also obligated to the Murray-Darling Basin to maintain the flow into it. One authority requires you to discharge more into the river; the other one encourages you to discharge less. Can you comment on that? How do you address this issue? Perhaps you can talk about the long-term implication because sooner or later we will have to resolve this conflict.

Mr Wilkinson—The environmental flows are set on the basis of the natural flows in the streams and what needs to be maintained. Initially we set that at quite a conservative level. In the long term we have a major project going with the Cooperative Research Centre for Freshwater Ecology to determine whether they are at the most appropriate levels. It could go up or it could go down, but the best guess is that it might be delivered by some other means. The way our water licensing is set up, when someone takes water from the environment it is theirs until it returns to the environment. In terms of waste water reuse, ACTEW does have the incentive to reuse that water rather than try to get licensed to take more water because that will cost them more. In return flows to the Molonglo, this does serve quite a significant purpose in securing water supplies downstream. In terms of the actual environmental flows, there is still probably a negative in that they maintain quite an elevated flow in the Murrumbidgee during dry periods when naturally it would be fluctuating. There is an issue there, I suppose. It is not so much to ensure that the flow is there; it is trying to ameliorate the impacts of a consistent flow level.

Ms Fowler—We could get further details on that for you as well, if you would like.

ACTING CHAIR—Yes, please. Also, you referred to one of the objectives of reusing water being to minimise health risk. Firstly, can you give us some details on how you actually achieve that? That seems to be an issue whenever we come across this recycling water business. Secondly, again related to discharging into the Molonglo, how do you deal with the issue of increased nutrients into the water? That would have downstream impacts as well. Another question, which I am not sure you would wish to answer off the cuff or whether you would like to do so in writing, is this: the ACT seems to be ahead of other cities, urban areas, in the way you deal with water, and I congratulate you on that. Canberra is a very affluent city with a relatively small population. Lots of things about Canberra are quite unique. How much of your water management practice do you think is transferable to other cities? And how do we do it?

Mr Wilkinson—How to do it might be the difficult bit. But the cost is what I think you are getting at.

ACTING CHAIR—And also the perception. It is public education, I expect.

Mr Wilkinson—It is. In terms of our established lakes and ponds and so forth, I think it goes back to when the work was done on that in NCDC days. Putting those measures in up-front in the planning and development stage is cheaper. The overall impact on the community is reduced. In terms of the way development was done at that time, if you had a water feature it increased the value of land out of sight, and that was returned to the government. We have a little wetland in north Canberra which has been developed by a community group with assistance from government through the planning and development stage. This was a redevelopment site going from a few flats to lots of flats. The run-off impact was going to be quite significant. In lieu of putting on-site retention in, they extracted \$165,000 from this developer to construct this wetland, and a bit of NHT funding.

ACTING CHAIR—I like the use of the word ‘extract’.

Mr Wilkinson—Yes. The developer had to do something anyhow to gain approval, so it was a government/community/private sector exercise. It is a really good example of a community partnership type thing. This community put in this wetland. The all-up cost will be about \$250,000. Had the government done it, it would have been at least twice that. The money came from the developer. Once the decision was made, ‘Yes, this is what we are going to do,’ the developer upped the asking price for the four units at the front of the wetland by \$50,000 each because of the increased amenity.

Ms Fowler—Going back to your question, I think the principles are certainly transferable to other cities, and other cities have actually taken on and demonstrated some of these initiatives. I know in Adelaide there are the Salisbury wetlands—and Brisbane and Melbourne have, too. Other cities are trying to do this. I agree with what Mr Wilkinson is saying, that if we can all learn and share the information about where these things have been tried we can learn from each other. I think they are transferable.

ACTING CHAIR—I think the most valuable lesson we can learn from Canberra is probably in the public education area.

Ms Fowler—Absolutely.

Mr Robertson—Certainly schoolchildren keep their parents honest in terms of using water in the house.

ACTING CHAIR—They do that all over the country.

Mr Robertson—That is a good thing.

Mr Wilkinson—Apparently one of the big reasons for trying to bring these values up in the neighbourhood area is that it involves less concrete and less hard engineering. Whenever there is less hard engineering there is less cost. It is a big attitudinal change. That is one of the impediments, as is the perception that maybe a bit of water laying around in the back of the garden is a negative when, in fact, it is quite a positive.

ACTING CHAIR—Mr Wijeratne has just handed us some information about ACTEW Corporation. Is it your wish that it be tabled.

Mr Wijeratne—It is some background information. We went through a lot of that information, but that is to provide you with the background detail. One of the things that has happened in Canberra over the last two years as well is that the water supply authority, which is ACTEW Corporation, has gone into a joint venture with AGL. We have ActewAGL, which is our operator and maintainer of water and sewerage infrastructure.

ACTING CHAIR—I will duly note that the information has been tabled and received.

Mr Robertson—Just on that, it is worth noting that the ACT government has retained full ownership and control of the water and sewerage infrastructure through ACTEW Corporation.

ACTING CHAIR—Yes, I understand that. Thank you for your appearance here today.

[10.14 a.m.]

BLACKMORE, Dr Donald John, Chief Executive, Murray-Darling Basin Commission

ACTING CHAIR—Welcome. The committee has not received a submission from the Murray-Darling Basin Commission, but we are grateful for your agreeing to accept our invitation to give us the benefit of your views in relation to this important topic. The committee prefers all evidence to be given in public, but should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private you may ask to do so and we will consider your request. Would you like to make a few remarks before we move to questions?

Dr Blackmore—Thank you very much, it is indeed a pleasure to be here. The reason that urban issues are a little bit to the side of what we do is that only five per cent of the water in the Murray-Darling Basin goes to urban consumption, and 95 per cent goes to rural consumption. What is also important is that enterprises that are within the urban communities of the basin—particularly Adelaide, which relies on Murray water—dominate the economics of the whole performance of the basin. The urban dimension is a very important part of the economic fabric of what we do but not the dominant driver in water supply. I would like to just take you through a very quick snapshot of what we have—an integrated catchment management—and then roll out the urban settings for the basin, including some discussion, I suspect, of Canberra.

Overhead transparencies were then shown—

Dr Blackmore—Firstly, it is a large basin, a million square kilometres—as big as South Africa or as big as France and Spain combined—consisting of 21 river systems, so it is a fair proportion of Australia. About 40 per cent of our agricultural wealth comes out of this area.

I want to talk about integrated catchment management, which is an emerging and poorly understood concept, and what it means because we still structure ourselves as a society pretty much on single issues and, unfortunately, our landscapes do not work that way. We are trying to bring about a change in thinking so that all the values that are important to a landscape are taken into account. We are a regional organisation. In the world of catchment management there is a set of national principles and we are overwhelmed by national principles, so there is plenty of those. We have regional authorities, and the commission is by far the largest in Australia—in fact, the largest in the world now in integrated catchment management.

We are now establishing targets for catchment health to understand what we are trying to deliver and how we go about delivering it so we can take the hand off the heart and get to be far more specific. Governments are progressively starting to put more and more resources into this area of activity: the National Action Plan for Salinity and Water Quality, NHT2 and a myriad parallel state programs. So it is getting a momentum, but as an investment framework you would have to describe it as still an incredibly immature process. I listened to the questions you raised earlier with our friends from the ACT about two-part tariffs and all the rest. No-one sends a rate notice in Australia for natural resources, so no person receives a rate notice for the

resources they consume other than for water. They do not do it for biodiversity; so, quite frankly, in the scale of process it is quite immature.

We have a well-developed structure embodied in legislation: ministers representing land, water and environment who must meet by legislation. They have committed themselves to that, it has been passed in all jurisdictions, so it is quite unique in Australian terms. It cuts across the Federation issue. We have a community advisory committee of the catchment chairs that is embodied in legislation and reports directly to the ministerial council and a board of directors, which is the commission and a technical secretariat, which I have the privilege of managing.

We have a broad charter. While we run the largest bulk water business in Australia as a bricks-and-mortar business—which is pretty straightforward and I will not bore you with it—this is by far the most complex issue: how to balance the access to resources across 21 river valleys which are all interconnected in some way. Then throw in the complexity of the Snowy transferring water in—we have three interbasin transfers with two of them very significant and one quite modest—and we have all of the complexities in our world.

We are also living in a world in Australia where, while the basin is 15 per cent of the area, it is six per cent of the run-off. So, even in Australian terms, the Murray-Darling system is an arid basin in an arid continent. We have responded to this as a society by building dams, basically. We have the highest variability of rainfall on earth, so we build dams to give us the security that we all need and seek. We now have storage capacity in the basin of 50 per cent more—this is government dams—than the average annual run-off of every stream. It is a very significant intervention by any scale anywhere. Hence, we are now starting to see on the other side of the equation environmental stress, obviously, and concerns and questions about what is sustainable and where the balance is and how the community runs that debate—all important issues.

The first issue the ministerial council looked at in the 1990s was to say enough was enough. There was no sense of environmental outcome in that. They had a look at the data and were able to aggregate it for the first time because of science and improved technology. Basically, they said, 'We will cap it at the 1993-94 level of development, and that includes everybody.' The only two areas that are incomplete in our circle are Queensland, which we can talk about at some stage if you want to, and the ACT. I will come back and talk about that in a little while because there are some issues there which will be important economically to the ACT. So we have a cap in place and we have an independent audit process for that cap, which I would like to table, and that material is available on the web all the time. It has all the numbers about which you were raising questions before about the ACT and water use and the lower Molonglo and so on. This has all of those numbers, the history and what the balance is, as well as all the other states.

It is also very important for Adelaide, for example. This year Adelaide has a rolling cap over five years—it is an average cap that keeps rolling—and they have to live within 650,000 megalitres. They almost exhausted their cap and would have had to enter the market to buy water. We have a water market which is indicated up there, and where that little purple line moves up is the annual trading volume. We have an annual trading volume now equivalent to twice the volume of Sydney Harbour. This is private individuals trading water, including urbans, industry, goldmines and new forest developments that come in and want a processing plant. So water trade is very big business. We have two water exchanges that operate, one at

Deniliquin and one in Shepparton. So you can go and place 50 or 100 megalitres and there is an auction.

The purple line across the bottom is the permanent trade in water—that is the water I trade to you permanently. We are trading on average under 100,000 megalitres permanently. The total consumption is about 10 million megalitres, so it is only one per cent. That is four times the volume in Lake Burley Griffin. That is the scale of people's private transactions to trade water.

ACTING CHAIR—Let me interrupt you. This is a question which perhaps is not relevant to your presentation at the moment. This large volume of temporary trading implies a more thorough use of the water. If people did not trade their water, if they had no need for it, it would just run back into the river, whereas this way every issue is used 100 per cent or close to 100 per cent. Does it affect the balance in the river?

Dr Blackmore—No. The cap provides the absolute upper limit. We have a cap on water use at the 1993-94 level of development so that, if that is the amount of water available and the cap sets it so that it does not create any more water, people who are operating in here have a choice of putting it on their property or selling it. Take a rice farmer, for example: the spot price for water in the last four weeks, as we came to the end of the irrigation season, went over \$150 a megalitre. The government charge for that water is \$22 but because of scarcity at the end of the year the price increased. So a rice farmer or a dairy farmer would make the decision to either grow some crop with that or sell it. A lot of people decided to sell and, at \$150 a megalitre, it is miles above the gross margin.

It has been the single feature that has driven economic efficiency in our basin. The major issue we have is that the trading bloc we have for water is too small. Each state enables you to trade within the state, and you can trade on an annual basis between states. We only allow trading downstream of Swan Hill—or Nyah, near Swan Hill—as a permanent interstate trade. Our ministerial council's intention is to open up the trading bloc to the Murrumbidgee Valley, the Murray Valley and the Goulburn Valley, so that we can trade between them. That is obviously constrained by channel capacity and physical issues. That will significantly improve the economic performance of those industries. If you want to know what the single most important thing for us to achieve in the next five years is, in terms of improvement in agricultural performance, it is to broaden this trading bloc—and we are doing it. COAG is demanding we do it. They do not have to demand we do it; we are doing it, because it is very sensible for us to do that. The trade is incredibly important. I can take you to farms now that do not irrigate at all; they are just professional traders. It is in their interests to do that.

I have not got time to take you through all the issues of nutrients and forestation and all the other things that an integrated catchment group would deal with—fish management and so on. However, I thought I would give you a snapshot of an issue which is very important in terms of the future viability of the urban communities in our basin, and that is salinity. We have the privilege to drink this water which is probably coming out of the catchment behind us—I look at my colleagues from the ACT. I would guess that it is probably about 20 parts per million in water. If I went down to Yass right now and took a glass of water out of the Yass catchment, it would probably be 700 parts per million, which is above the World Health Organisation's upper limit. So salinity is going to be an issue which will dominate the thinking of small urban

communities and of Adelaide over the next millennium. Basically, this is not going to go away from the Australian environment.

We have salinity scattered all up the western side of the Great Divide, and as soon as Queensland finish doing their work the red area in Queensland will be far more pronounced than in the southern states. Queensland has a huge salinity problem.

ACTING CHAIR—That is not showing yet?

Dr Blackmore—That is not shown on that diagram. This shows the situation in 1996, and they have been investigating that for the last few years and have now discovered the extent of it—or they are now discovering the extent of it—and it is a very significant problem. So we are all in the same boat in our basin.

If you go into Victoria, just to look at a particular area to give you an idea of the rate of change, the River Murray is at the top of that diagram, and you have the top of the Great Divide at the bottom, and the areas that are white are the irrigation areas in that. The little coloured bits on the aqua are where the watertable in 1996 had risen to within a couple of metres of the surface—and hence it has some impact on water quality. A hundred years from now, that will be up to 800,000 hectares of land. That is our best practice approach. That is already posted; it is on its way. If we continue with business, even with the best practice we have now, that is the outcome.

The reason you are getting all those speckles close to the irrigation areas is that the water is trying to flow north-west. That is the natural way it flows, but when it gets to the irrigation districts, they all have high watertables as a matter of course, and it cannot flow any further, because there is a 20-metre ground water mound sitting underneath, and so it just builds up. There is an underground dam sitting there, which this water comes up against. So that will have an effect on small urban communities because it will affect their water supply and their access to ground water. We are going to see this—and this is probably the best data around. We are also doing a lot of work with airborne geophysics which in his past life was one of Minister Tuckey's favourite things. It is a very important tool, but it is not the only tool.

ACTING CHAIR—I thought it was the only tool.

Dr Blackmore—Put him in charge of marketing. It is a very important tool. The commission has just spent \$1.3 million doing it in one catchment and the Commonwealth has spent a lot of money in Queensland with it. We can now start to find out where salt is down to the paddock scale, and that has real implications for land management and the like. The scale of the thing for us is that we are going to end up with three to five million hectares. That is grossly underestimated because the Queensland number is grossly underestimated. Tasmania is about eight million hectares. So three to five million hectares, two-thirds of the area of Tasmania, will be out to salt in dryland catchments. So if you are looking at a hazard to urbans, this is the hazard. This is why integrated catchment management is so incredibly important. If we are going to start solving these problems we cannot regulate a solution to that problem. We have to manage a solution, and that is what we are attempting to do.

We have a salinity strategy. We currently run the largest system of tradeable pollution entitlements on earth. We have just converted them, trying to keep the salinity of South Australia at 800EC for 95 per cent of the time. All that means is that we are trying to get Adelaide to have water just a little lower than the World Health Organisation upper limit for most of the time. We think that is a reasonable outcome. So it is a very serious issue. There are targets now on the whole 21 river systems and the states, including Queensland, have committed themselves to be accountable for those targets. So we are doing a lot. We are currently pumping 1,100 tonnes of salt away from the River Murray each day just to hold the status quo. We are about to spend another \$60 million to pump another 900 tonnes. That does not fix the river's salinity—

ACTING CHAIR—Where do you pump it to?

Dr Blackmore—There are about 160 evaporation basins. We take the water out and we put the salt back into the ground water systems and re-store it because there is no economic purpose for it currently.

ACTING CHAIR—You put salt back into—

Dr Blackmore—Back into the ground water system, from where it came. That is the safest place to store it.

ACTING CHAIR—That will just make the ground water more salty, will it not? Does it not compound the problem?

Dr Blackmore—It will, in about 1,500 years. We design all of these schemes for a life of 1,500 years. Hopefully we will get some smarter technologies by then. It has been very difficult for us to find evaporation basins that leak. I am not going to talk about evaporation basin design. Everybody thinks you have to store the salt on the surface.

ACTING CHAIR—You cannot transport it to the sea?

Dr Blackmore—You can do all of that, but to build a pipeline to the sea, which we investigated in the 1990s, would have cost about \$6 billion in 1990 dollars.

ACTING CHAIR—I am sorry to distract you; just go ahead.

Dr Blackmore—So we have looked at all of those—and that only deals with irrigation and does not deal with the problem I have just described in dry land. So you have to fix dry land on-site. We have farming system designs and all sorts of other things that we are trying to do to support that. There is a new CRC for plant based solutions to salinity, of which I am the deputy chair. So there is all that sort of stuff happening. Salinity is a serious business.

Integrated catchment management—we will just run through them. In our view—and I do not know how this relates to your inquiry specifically—without integrated management, Adelaide is going to struggle. If we do not make the other states accountable for the quality of the water that comes out of their catchments and there is not some sense of shared responsibility, the only thing that can happen, because of human nature, is that a catchment to you is where you stand

and look to the mountains and you are not entitled to turn and look 180-degrees downstream. That is the way human nature works. So what we are trying to do is to change that dynamic. It has been an interesting journey so far. We are working to make the rivers and lakes the report card of our civilisation, because they reflect everything we do.

ACTING CHAIR—Thank you, Dr Blackmore. You anticipated some of our questions. The reason we asked you to come along is firstly because we understand that Adelaide depends on the Murray's supply of water. Even though the Adelaide agency tells us they do not have a supply problem, they do have a water quality problem.

The other thing that interests me is that, because the Murray-Darling Basin is basically a closed system whereas most of the urban areas are open systems where the waste water discharges into the ocean, Canberra, being within the basin, discharges waste water back into the system, which has major implications. You were talking about the ACT and you said there were some implications in the work you have done, particularly in salinity. Can you enlarge on that?

Dr Blackmore—I think the issue is that we have not negotiated a cap for the ACT yet. They use 0.3 per cent of the water of the basin so, in terms of the problems we need to solve, it is not a major issue. In the cap review document that I have passed across, the independent audit group who were asked to report on this, chaired by Dr Wally Cox from Western Australia—so it is genuinely independent of the basin—have put on the table a number to start the discussion about what the cap in the ACT should be. For that to work we have to establish a trading bloc for the ACT to enable the ACT to buy water within the Murrumbidgee Valley or out of the Murray Valley and bring it across the Snowy scheme. There is a huge amount of infrastructure available to the ACT in terms of water supply that is not in the ACT that requires a different set of mechanisms to what, historically, were available.

One of the future options for the ACT is to continue to defer building a new dam and take long-term leases or options over significant blocks of water at relatively low cost compared to the construction of a new dam and have that water delivered at the time that is critical to it. That requires a whole lot of negotiations which first need to have a trading framework in place. Further down the valley, that already exists. Within the last 12-month water year, Adelaide were very close, quite frankly, to breaching their cap. They would have had to buy water. They do not see that as a problem because, while buying 20,000 megalitres of water on the market at \$50 a megalitre is a \$10 million intervention, they do not have to build another dam. They are attuned to just sitting there ready to do it because we have established a trading bloc for them to operate in.

We have not done that for the ACT. Intellectually, it is not that hard to do; it is a matter of just getting it done within the priorities we have. Then you have to negotiate with the Snowy if you want to bring water out of the other valleys back through here and load it into the top end of this system. There are all those options that are available. In the Murrumbidgee Valley there are two million megalitres of water allocated and the ACT's net use last year I think was 33 gicalitres—33,000 megalitres. It is an important amount of water, but it is not the dominant issue. You asked a question about waste and the way waste is managed?

ACTING CHAIR—Yes, particularly downstream nutrients.

Dr Blackmore—We have a nutrient strategy for algal management for the whole of the basin which governments have signed on to. If we had been sitting here having this conversation in 1990 or 1991, governments would not have believed we had a nutrient problem. Then we had the blue-green algal bloom on the Darling. We went to our ministerial council two years before that bloom and indicated to them that, based on the science, the underlying nutrient levels were sufficient in the right climatic conditions to cause a bloom. Now no-one could predict a bloom like the Darling bloom, so let's not overstate that—but the intensity and frequency of blooms were going to increase. What has happened since that bloom is that we have negotiated with all the governments a nutrient strategy to reduce algal growth, they have gone in, and most of the communities have taken their waste away from the rivers. So you have a philosophy in New South Wales for off-river disposal, and you have a philosophy in some governments for nutrient standards at 0.1p or 0.2—depending on where you are—and then to put that water back into the systems. There is a trade-off: at very low nutrient levels, the water is quite valuable back in the systems; but if you are at 0.5 parts per million phosphorus or above, there is a serious problem in fresh water, in clear water, because we will just end up with blooms.

To give you an idea of how serious it is for us at the moment, we are always just right on the balance in the Mildura weir pool, with blue-green algae through January, February and March each year because the flow is low. Beside a very large urban community, there are 19 wineries that exist off that weir pool and the one immediately adjacent to it. If that weir pool turns blue-green and becomes toxic—and we have come very close in the last two years—we have got ourselves a reputation issue to deal with in terms of clean green product. We also have a problem with our urban communities, and that is why we are carting tonnes of activated carbon to take the toxins out, because even if you can get rid of the algae you still have a lingering toxin problem which you have to manage by activated carbon. I have not answered your question with that, but I am just saying that we have got a nutrient-rich environment, and we have got a trade-off between adding nutrients at very low levels which probably are not going to be a significant issue and adding nutrients at higher levels which will be a huge issue.

ACTING CHAIR—I am probably straying into forbidden territory here but you also say there is another gap in the cap, in Queensland.

Dr Blackmore—There is a gap in Queensland and the Queensland government were committed to putting in place in 1995 a process called WAMP—water allocation management planning process—which has the principle of taking a conservative approach to water allocation. The problem was that their Water Act did not cover all the water—it covered the consumptive use of water in streams and it did not cover flow across the flood plain. So people built large storages that captured the flow across the flood plain, and as most of the Queensland and northern New South Wales streams are relatively small streams with huge flood plains they captured that water. It was not until 2000 that they changed the act, by which time, quite frankly, the horse had bolted. The question for Queensland and northern New South Wales is what decision they will take on the cap. We are advised by the Queensland government that they are close to announcing that. The independent audit group established by the commission will provide an independent report to ministers on whether it meets the original views, the NCC are looking at Queensland against their own principles, and I am sure we will have a view about whether they have breached their own principles in terms of the COAG agenda. So it is a work in progress. However you would describe it, it is a bit untidy.

ACTING CHAIR—This is a quick question on the term ‘environmental flow’, which has been raised a number of times. My understanding is that environmental flow is the flow in the river at a rhythm that will maintain, as closely as possible, the natural environment. Whereas a lot of people when they talk about environmental flow, particularly in terms of trying to put water back into a river, are talking about more of a steady flow. That seems to be misinterpreting what the river needs in terms of an environmental flow.

Dr Blackmore—Absolutely. A steady flow would be a disaster for us, so we do not want a steady flow. The ministerial council at its last meeting probably took the most significant single decision in environmental management in Australia when it said, ‘You are empowered to go and talk to the community about putting back into the River Murray an additional 350,000 megalitres, an additional 750,000 or an additional 1½ million megalitres: start that conversation.’ We have enough science to indicate that our rivers are under stress and will get worse. We know that fish populations are 10 per cent of the natural biomass of fish and declining and, on the best advice, will decline to five per cent. So those trade-offs are very significant for us as a community.

With regard to environmental flows, we cannot sustain our rivers. It is all a matter of choice now. The science tells us that to have a moderate chance of a river system that is self-managed, with most of the environmental values intact, you have to have about two-thirds of its natural flow and flow pattern, so a variation in flow. We are not close to that. The River Murray at the mouth on median flows is about 27 per cent; and at 50 per cent of its natural flow you have a low probability of keeping the river intact. So you are going to start to lose large slabs of flood plain and so on.

We are now actively looking at how we manage this. We do not have a choice in the Murray-Darling Basin about self-managed environment—it is a fairy tale. We are into environmental farming. These are concepts which are foreign to the community at the moment, but that is what we have got to do. I can take you to groups that are environmentally farming the flood plain. We have got to reconnect the river to the flood plain—that is why it flows in the bottom of the river. I could triple the flow into South Australia and add almost no environmental outcome unless I can reconnect the river to the flood plain, because that is where the health of the river comes from: that is where the fish breed, that is where the birds are, that is where the carbon gets back into the system, that is where the nutrients get soaked up. We have got to redo at least some of that.

There are 7,000 wetlands along just the River Murray itself that are all classified. We are now starting to actively manage them, and if you get a chance I would encourage you to go and have a look at a couple that are being farmed. We have professional environmentalists that farm them: they dry them and then they wet them. In one in South Australia, near Renmark, the bird count five years ago was 1,200. It is now 21,000. They wet and dried that one three times. What happens is that they are the nutrients that are causing the other problems, and we want those nutrients captured in a vibrant way on the flood plains so they go out and they sit with the sediments. But, no, we do not do that; we leave them in the bottom of the river, they accumulate and hence we have a problem with algal blooms and the like. We have taken out part of the food web and part of the functioning and we pay a price for it: we see blue-green algae, sedimentation and so on. We have an exciting 18 months in front of us to see whether governments and communities want to reset this ship. I do not know what the answer is going to

be—and it is not a \$5 intervention. You are most welcome to join me on 1 July for the official launch.

ACTING CHAIR—Where is that?

Dr Blackmore—I do not know yet. Find somewhere that is bullet proof!

ACTING CHAIR—Keep us on your list.

Senator TIERNEY—I used to teach geography in another life. When I joined the Liberal Party I made a speech to the state council about the Murray-Darling Basin because of their projections of it being desert in 80 years. In the year 2000 I saw an article that projected it would be desert in 65 years, so actually it was right on track. I just wanted some sense of how we are going in the battle broadly. Do you think, particularly given changing government attitudes at the moment and changing technologies, that over the next 100 years we can turn this around or is it going to be like your map of Victoria there? Is that inevitable? I know this is a bit of crystal ball gazing. But, with the right policies, resources, technology and the will of the community, can you see any hope for really turning this around?

Dr Blackmore—I can, otherwise I would have slashed my wrists before this. At a public policy level, the way governments have behaved in caps and salinity is beyond peer worldwide. You might argue those things are too late and not enough, but for our states to fetter some of their sovereign rights—which is basically what they have done—is a positive thing. The scale of the ground water change is so profound that it is almost within geologic time now to turn it around. We have taken 15 billion trees out of the basin; we have increased the recharge. Under a national system the recharge generally is in the order of three to five millimetres of water that would go through and drive the ground water system. That is what our national systems are involved in.

We had a bit of salt around, some fresh ground water, and some salty ground water. But when we removed the trees and went into our current farming systems, the three millimetres of recharge became what is now 65 millimetres of recharge. It is not four millimetres or five or six or seven or eight. It is 65 millimetres. We do not have farming systems. You could set up the best economic set of policy instruments here and put God out as a farmer sitting on a tractor and he or she would not be able to fix that problem across broad areas in the Mallee, for example. We simply do not have crops that can soak up that water. We go into wheat, we fallow and so on.

We do have trees, so we can go back with trees, but they are not economic. It means a huge subsidy from government to go out there because in the 500 to 800 millimetre rainfall zone trees are not economic as forestry. There are smart ways to do it. We have got governments to agree to a thing called a vegetation bank. Catchment authorities determine land that they want to treat for salinity. This is land where there is salt underneath and we want to cut the water table off, not where you see the salt. We tender for those services so we get the big forestry companies in and they determine what they are going to do. Government buys the salinity credit from that development. That is the subsidy and we have it as a salinity credit.

If we do not get into that level of innovation soon, we are going to be in a lot of strife, because we are going to just keep going with a cosmetic fix—a few trees here, a bit of agroforestry there. If we cannot make the CRC for plant based solutions come up with new systems like moving lucerne so that it is acid resistant, because these zones are all acid as well, we have little hope. So we are putting huge efforts into really trying to stretch the innovation. On the positive side, airborne geophysics is one of about 10 technologies that now enable us to find out whether salt is in the landscape.

Senator TIERNEY—I want to come back to that particular aspect in a few minutes.

Dr Blackmore—We are not going to turn this around in 30 years, basically.

Senator TIERNEY—You have made some reference to the ministerial council. Are you picking up a sense of a sort of will to really address this? We are picking it up at the federal level—but I do not know what is happening at the state level—with champions like Wilson Tuckey, who has really educated the parliament and the government members on this matter and has had major influence on actually moving some real dollars. What is happening with the three states that are under your commission?

Dr Blackmore—They are flying, basically. If you analyse them state by state, South Australia—because salinity is in their face all the time—have been engaged and are engaged, getting on and doing things. Victoria have had salinity plans for each of the regions for a very long time. New South Wales are struggling with it because of complexity, and they will struggle with it a bit further, because they have got the most number of basins and, quite frankly, when we look at the data, they have got the biggest complexity. New South Wales are working hard to do it and they have put resources in to match. Queensland really saw vegetation and those things as a biodiversity issue but will come to the view, I think, that a change in vegetation status and land management is really a salinity problem. When we get enough of the community and the government aware of that as they produce their data it is inevitable that they will change and they will come on board much more strongly.

They have all been prepared to be accountable for salinity. The southern four governments all put money into the same pot, and I invest it, in terms of salt interception schemes so they can buy their pollution entitlements for each of the valleys and they can run the valley strategies against them. They put money into a pot and we invest it where it is smartest irrespective of state boundaries. So all that maturity exists.

Senator TIERNEY—Let us go to the fundamental underlying issue of the way we have priced and managed water historically. In the deserts of Israel they measure it by the drop against a plant and we just throw it everywhere, out into open drains, evaporating, because price was zero originally. Now that that is all changing under COAG agreements, in terms of solving this problem of water tables rising because of excessive use of water, are those price signals starting to have some effect on the way people are using water or the technologies they are using to actually reduce the amount of demand, particularly in irrigation farming?

Dr Blackmore—The answer is a combination of three things. One is the price. The second one is self-management of irrigation so you have now got irrigation regions being privatised or corporatised. The third and the most significant issue is trading because trading sets a value that

is far higher than government can ever set and it is the marginal value and you have got a choice. The marginal value for water the other day on the short-term market was \$150 a megalitre and the government charge for that megalitre with full cost recovery was \$22. The signals that are available now to become more efficient are very profound.

We are 10 years into an evolution. If I went into South Australia in 1995 there was one fully automated irrigation system with everything: the deep drainage monitor, the weather station and automation. There are 95 of them now. So we are seeing at that end of it a lot of innovation. But there are industries where, because of the nature of the industry, there is a limit on the innovation so if you go to an annual pasture area it will still be flood irrigation using technologies that have been around for millennia. With rice, there is little choice but to flood currently because of the nature of that crop.

ACTING CHAIR—There are dryland rice species?

Dr Blackmore—Yes, there are. The problem that we have got at the moment is they cannot stand the temperature. They are using the water to provide the temperature buffer because in January, when they are shooting, if the temperature drops below 23 degrees you get a very significant reduction in production so there are those sorts of issues floating around. There is a CRC for rice and there are trials of rice being grown on trickle irrigation as we speak. I do not know where that is going to lead. A better outcome is to broaden the trading bloc which I mentioned earlier so that we can trade water and put much more economic focus on water between the Murrumbidgee, Goulburn and Murray valleys where there are six million megalitres of water. If we open up the permanent trade between those valleys—and we have a lot of capacity to do that—we will certainly change the current dynamics of water use efficiency.

Senator TIERNEY—What about cotton? Is there any hope of getting the volumes needed by changing technologies, as you mentioned with rice?

Dr Blackmore—In terms of water use efficiency, cotton is a very efficient crop, so the question really is whether cotton has a fair share of the available water resource in the country. As a crop, the cotton industry, out of all the industries I deal with, is the most innovative. They came into it late. They largely brought private capital to build their infrastructure and they have got part government water and part private water. Quite frankly, if you go and have a look at the efficiency of their operations, they are by far the most efficient water users as a group.

Senator TIERNEY—But they do not have enough water, do they?

Dr Blackmore—There is never enough.

Senator TIERNEY—I was thinking of the 1995 drought where they pumped the rivers dry and the aquifer as well and still could not get enough water.

Dr Blackmore—I think the issue of whether any of these things have a fair share of the water is the key question, and that is why I think the debate we are about to have on environmental flows is going to be a fairly active debate.

Senator TIERNEY—Which brings me to the point that, being the driest continent on earth and having conflicting land use demands for water in the Murray-Darling Basin, including environmental flows versus crops, we really do not seem to have enough water capacity. In the 1950s and 1960s, and the 1930s as well, we built a lot of dams all over the place. We are now in a political environment which is very hostile to that, but political environments can change over 50 or 100 years. If there were no politics in this, just in a pure sense of getting water into a river system, I wonder if you have any view on a river like the Clarence being dammed and turned into the one across the ranges, the Namoi, and water being run down the Namoi in terms of giving you a greater volume so you could do environmental flows and crops like cotton. If politics were out of this question, if we were back in the fifties, would that be a reasonable way of managing water, if it could be practicable?

Dr Blackmore—Obviously we have looked at this many times. I am just trying to work out how career limiting it could be!

Senator TIERNEY—We are talking about a theoretical possibility.

Dr Blackmore—Once upon a time.

Senator TIERNEY—We work in the political realities.

Dr Blackmore—The answer is that it is not worth a candle for environmental flows.

Senator TIERNEY—Clarence volumes, though.

Dr Blackmore—Not worth a candle. They would be worth a lot in the Namoi, but the Namoi goes into a thing called the Darling, which runs to the most arid zone, 900 kilometres of the Darling. You could not get it there on the back of a flood because of the diversion capacity across. If you want the Clarence to grow a crop in the Namoi and run the economics on that, run them, because that is what it will do. If I am going to run 1,000 megalitres down the bottom of the Darling, half of it is going to evaporate, and 500 megalitres down the bottom of the Darling—you may as well be whistling in the dark, basically. If you want it for an economic purpose that is a different story, but it is totally misleading to think that it is going to deliver—

Senator TIERNEY—It does not help your flows.

Dr Blackmore—No. The Murray environmental flows—we have already got storage capacity 50 per cent more than the average annual flow of every river, so that already exists in the basin. Another dam in the basin is not worth an economic bean.

Senator TIERNEY—It is on the Murray side.

Dr Blackmore—This is everywhere, right across: the Murray-Darling, the whole lot. The whole Murray-Darling system is already so highly regulated, and that is why the Murray mouth now is one of a few rivers on earth where we have a reverse delta; there is more energy from the sea coming up the Murray than there is from the river going out. We have got this delta growing up the Murray, which if you were a dredging contractor you could do very nicely from in the next year or so.

I have looked at Bradfield schemes and at transfers in Victoria from particular catchments. We divert a huge amount of water from the Glenelg across into the Wimmera system. We obviously divert a heap of the Snowy, and we are now going to dump some back. If we want to develop irrigation in Australia, it is best to do it near the source. There is a huge amount of potential in Australia to do that. There are sensible ways to build dams; I have just spent three years as a commissioner on the World Commission on Dams, running this debate worldwide. There is an international best practice rule, which Australia could easily follow. It takes a lot of emotion out of the debate. Nevertheless, it is certainly going to be a seriously hot political issue. There are ways through it, but there is no short-term answer like 'turn a bit over.'

If I improve irrigation efficiency by 10 per cent, I generate a million megalitres of water. In anybody's mind-set, is that beyond what is possible with technology? Ten per cent is a million megalitres of water. That is twice the volume in Sydney Harbour; you have serious water that you can start doing things with.

Senator TIERNEY—On the micro level of the farm, judging by some of the work the CSIRO has shown us and some of the advocacy of Wilson Tuckey, it seems as though we are coming to a point where we can plot for farmers where particular problems are—say, salt and things like that—and then advise where trees and crops should go to help the problem on a micro level. If you did that right across the landscape, you could possibly have a major impact—

Dr Blackmore—You would have.

Senator TIERNEY—I am thinking particularly of types of trees that are coming online now. Yates has got three hybrids, I think—a blue gum, a rivergum and something else—and the CSIRO are working on others.

Dr Blackmore—Yes, they are working on a heap of them.

Senator TIERNEY—You will remember that Bob Hawke came in and said, 'Let's plant a million trees,' or a billion or whatever.

Dr Blackmore—One billion.

Senator TIERNEY—I think the plan was just to plant trees, but we now seem to be at a point where we can target that a lot more effectively. Do you see that as a major ameliorating factor?

Dr Blackmore—Absolutely.

Senator TIERNEY—If we could micro advise—

Dr Blackmore—The question is a political one. The technology is available now to find out where salt is in the landscape. It does not have to be done using airborne geophysics; there are other technologies. So we can find it: are we then going to publish the maps and zone the land, suitable for purpose? If I had my computer, I would flash up the exact slide you need to see now, which is a 50 square kilometre block at Cootamundra. You would see where the salt is. It

is all over the landscape in different bits and pieces. We have the technology to get that down to where the fence lines are. As soon as we publish those maps, we have an issue with people's wealth being impacted. I do not think the banks, for example, will be dumb in this matter; in a couple of nanoseconds, they will work out where they are going to provide long-term investments.

I have been trying to challenge the public policy debate within my commission and within the ministerial council. The technologies that are available will enable us to zone land suitable for purpose, and that is going to confront people. Senator, you said that we would then encourage people to do things, but the data shows that the scale of it makes it beyond their financial capacity to do, even with huge support from government. They will be out of business. Unfortunately, because some people's whole properties sit over the top of one of these areas, there is a social issue to deal with if you want to stop the salt. That is where we are weakest.

We have done it in irrigation. In the 1970s and early 1980s, we did it by classifying the Tragowel Plains Pyramid Hill area into A, B, C and D class soils, with C and D class soils getting a subsidy to fence them off—never to be irrigated and no inputs on them. You can now drive through that area at Pyramid Hill, and there are all these areas sitting there—about 30 per cent of the landscape—that are just left there. But if you go into drier land, unfortunately that is not the case. It is not uniformly distributed; therefore, you have a social equity issue to deal with. The challenge is: what is the property right in ground water that is salty? What is the private property right in that? It is under my property; it might be 20 metres down, or 10 metres down, but eventually it is going to hit the surface. For me, that is the debate. That is the absolute challenge we have to roll this technology out.

Senator TIERNEY—Because if the salt does hit the surface, the land will not be worth anything anyway.

Dr Blackmore—Yes, but you want to intervene 30 years before it does, otherwise you have set up a geological process where the recovery takes you 100 years. We do not, like lemmings falling over the cliff, need to experience that. Politically, you are obviously in a much better position to judge how that would be handled, but we will be loading up that debate. You cannot hide. The Wilson Tuckey snowball, if you like, on airborne geophysics—it leaves you nowhere to hide in this debate.

Senator TIERNEY—Could you give me a definition and a few short examples of your term 'environment farming'?

Dr Blackmore—Let us say that I have 100,000 megalitres of water of 100,000,000 megalitres of water that the government put aside for Barmah-Millewa Forests for environmental purposes. So there is 100,000 megalitres, which we leave in Hume Dam. It is useless as an environmental flow unless we put it on the top of a flood that comes out of the Ovens River, because then we put the 100,000 megalitres on the top over 30 days and we get enough water to get out. I have appointed an environmental manager for that water, and he can say, 'I have a choice: I can either push this water right out to give the redgums a water and, as a consequence, I will get some bird breeding or fish breeding as well; if I wait until October, I can maximise cod breeding; or, if I wait until the end of October, I can do a bird breeding event, which will probably take me into January if I have enough water to complete the cycle.' So he

makes a choice. Sometimes, you can get two of those values out of the one flood, but often, because the floods are not big enough any more, you can only get one of those values as the primary value.

He can then go on and say, 'I have 30,000 megalitres further down the river.' It does not matter where. 'I have hundreds of wetlands. Which wetland do I put the water in?' And they have regulators on them. So he has to make a choice. We have to make an assessment of when it was last watered; what its health is now; what populations of birds we are trying to support to meet our international obligations with the Chinese and the Japanese for migratory birds, so that we have enough of those. Is it a dry year? Do we have enough of that sort of wetland around, because it is dry or wet, or do we go into fish breeding?

They are choices; they are no different from the ones a farmer makes when he makes decisions on crop, rainfall, markets and so on. This is so immature that there are probably only three people in the country who will even have a conversation about it. I am trying to confront people and say that we are in fairyland if we think we have a self-managed environment for most of the basin; in Kosciuszko and a few of those areas, maybe, but for the vast majority, no. So I am really pushing us to become very good at it. If we are good at it, we will be the best in the world at it, because most people still think that you can regulate the environment. As a personal view, that is going to lead us to a very poor outcome.

ACTING CHAIR—Thank you very much, Dr Blackmore.

Dr Blackmore—I leave with you three documents related to the commission.

ACTING CHAIR—Dr Blackmore also presented another document earlier in this review. Is it the wish of the subcommittee that the documents presented to the committee by Dr Blackmore be tabled? There being no objection, it is so ordered.

[11.23 a.m.]

CROCKETT, Mr Jonathan, Environment Business Australia

ACTING CHAIR—I am Senator Tchen from Victoria. I am the Deputy Chair of this committee. The chair of the committee, Senator Allison, is fogbound in Melbourne, so you are talking to a reduced committee. With me is Senator Tierney from New South Wales. We form a subcommittee of the main committee. I formally welcome you. The committee has your recent submission, which we have already published. Thank you for that submission. The committee prefers all evidence to be given in public but, should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private, you may ask to do so and we will consider your request. I invite you to make an opening statement before we move to questions.

Mr Crockett—Thank you. By way of background, I have worked as a chemical engineer for about 30 years in the water and waste water industry in system planning design, operation and environmental management. The firm I work for, GHD, employs over 2,000 people. We are an employee owned independent consultant organisation. Around a quarter of our business is in the urban water sector in Australia, New Zealand, South America, Asia and the Middle East.

I am representing Environment Business Australia, or EBA, which is the peak body for the environment industry, which is defined as the sector that provides services and products aimed at managing, rehabilitating and protecting the natural and built environment. EBA has 400 members, including organisations such as major equipment suppliers, water companies, manufacturers, contractors, research institutes and independent consultants of various types—financial, technical et cetera.

The submission sets out a number of issues and makes two particularly important recommendations. One of those recommendations is that EBA would like to see governments at all levels develop and commit to a broad, integrated and long-term policy on ecologically sustainable development. We think that the majority of the community support such a policy and that it would drive industry to achieve sustainability objectives. A second recommendation is to implement one or more major integrated urban water infrastructure demonstration programs.

The key issues identified in EBA's submission include at least the following. Firstly, the financial policy and regulatory framework in Australia is somewhat of a constraint, at times, on innovation. Secondly, often the project delivery and tendering processes we adopt do not deliver the best outcomes for urban water management and often demand huge input of resources for little return. Thirdly, despite definite improvements through the COAG reform process, we still have conflicting and varying regulations and systems between the states and the Commonwealth. Fourthly, as a community, we regard access to cheap, high quality water in virtually unlimited quantities as a right; in other words, we grossly undervalue water. Fifthly, ongoing investment in the water sector is relatively low compared to the importance of water supply and waste water services and stormwater management, and certainly relative to the consequences of failure that results from underinvestment. Sixthly, decision making horizons in

government are often too short, and reform is too frequently interrupted and slowed by-election activity, with our relatively short parliamentary terms. Finally, decisions related to major urban water issues are too frequently made without a thorough, integrated decision making process. I am conscious that there is limited time, and I would like to expand on two or three of those issues if there is time.

ACTING CHAIR—Yes. Please go ahead.

Mr Crockett—Undervaluing water is a key point. We get water delivered to us for about \$1 per tonne through the tap, or \$1 per kilolitre, and from childhood we learn how to waste water. The United Nations Environment Program regards the supply of 60 litres of potable water per person per day as a reasonable target for a satisfactory lifestyle; but in Australia we can exceed 1,500 litres per person per day, and we average around 400 litres per day. So this culture of consumption permeates through society and into industry, where virtually all the products that we produce require from tonnes to tens of tonnes of water per tonne of product. Yet, at the same time that we are willing to pay over \$1,000 per tonne of water for drinking water purchased by the bottle, we complain about small excess water charges.

The second key issue is underinvestment. It has been shown by extensive studies that ongoing investment in our urban water infrastructure is below the levels necessary to maintain and develop existing systems. We have regular failures of our often more than 100-year-old underground infrastructure, and they cause such problems as a reduction in or interruption to service, traffic disruption and, in some cases, avoidable ecological impacts. We also lose water through leakage. Many city and country sewerage authorities are frequently some years behind meeting adopted state and federal environmental policies and regulations.

The most important issue, though, is lack of integration in our decision making processes. Many of the vital decisions at the policy level, particularly on urban water strategies and projects, are often made without thorough definition of, firstly, the objectives, secondly, the evaluation of options and, thirdly, consideration of the consequences. Urban planning activity is fairly rarely closely linked to urban water management planning activity. In the few examples where decisions have been made integrating a wide range of environmental, social and economic aspects, urban water management solutions derived have often been much more durable and closer to the objective of ecological sustainability. For example, in Victoria recently, the government said, 'We have a target of 20 per cent reuse of waste water.' One of the consequences of that is that no sewerage authorities want to accept salty waste water for industry because they feel it would compromise reuse potential.

I have a few personal comments to add on the specific terms of reference. They are partly reflected in the EBA submission, and I think many of my colleagues who have an understanding of urban water issues share at least some of these views. The first one is on ecologically sustainable water use in the urban context. If we are to achieve it, it requires some quantum changes in attitudes and practices. It will not be achieved, in my view, while our economic growth is measured and driven largely by ongoing growth in per capita consumption of materials and energy. I believe, though, that we can achieve a new kind of economic growth and an increase in quality of life with reducing material and energy consumption, but it really requires some profound changes in how our economy works.

On studies and reports into most of the technical and administrative aspects of urban water management, I think we have more than enough information. There is a huge body of knowledge to draw on, and much of it is neglected because of failure to adequately draw on past work. If we had a clear statement of what constitutes an agreed national strategy for achieving ecologically sustainable development in the urban water context and more broadly, it would be a challenge to get people to apply this knowledge. Often the people who have the most knowledge are those who are too busy or otherwise not capable of influencing decision makers. The answer is that we all have to work together in an integrated way and no one discipline has an adequate knowledge to make these things advance. I notice one of the terms of reference relates to reuse. Whether that is of grey water or treated wasted water, it has a place in the urban water management context, but there are issues. It can seriously impact on ground water and soil conditions due to the accumulation of salts and contaminants when we start recycling.

My last comment is on environmental management systems—again, an aspect of the terms of reference. I think these, including triple bottom line reporting provided they are an integral part of business and quality management systems, have already had and will continue to have an effect of causing a rapid advance in identifying problems and solutions in the urban water sector. Certification of those systems is not a guarantee of success. On behalf of EBA, I would like very much to thank the committee for giving us your time to listen to our submission.

Senator TIERNEY—I turn to your comment on grossly undervaluing water in the country, historically. I would like to get a sense from you of where you think this is going, urban and rural. In the last 20 years there has been a whole lot of price signals put in, particularly since COAG. In terms of the legislation and process now, will what is in place bring us to the point of managing water in a sustainable way?

Mr Crockett—My personal view, and I think many in EBA would agree, is that yes, there have been great advances in diverting water abstractions, in the irrigation sense at least, into higher value uses and in improving efficiency and it has driven the price of irrigation water up. In the urban scene, though, there has not been so much of a change. And in both sectors, irrigation water and urban water, we still value the ecological services related to the water catchment at zero. Whilst on the seaboard coast you could argue in most places we are not particularly overcommitting resources, there are, even in the wetter areas, examples where we do massive diversions and reduce what are commonly called environmental flows to levels that probably are reducing those ecological services that we are dependent on for sustaining life in the future. So my own view is until we actually price in impacts on ecological services that are vital, be it biodiversity or other factors such as recreation and tourism value, we are undervaluing water. There have been studies done that would say water is worth a lot more than \$1 a tonne. It is more like \$20 or \$30 a tonne if you start valuing in those things, which our system does not do.

Senator TIERNEY—We heard from the ACT this morning. They claim they have implemented the COAG reforms best and seem to be factoring in some of those aspects that you just mentioned. Do you see the ACT as best practice in Australia on this, or are there any other examples?

Mr Crockett—I would support that view, that the ACT have been one of the leaders around Australia in many aspects, particularly in relation to reuse. To some extent they have got an

easier task than the larger capital cities but, yes, they are highly respected for the initiatives they have taken.

Senator TIERNEY—Page 2 of your submission identifies inadequate research and development as one of the barriers to taking up best practice on water management. In the light of that, can you offer a general view on the cooperative research centre model? We do have a number of CRCs on water around the country. Is that the way to go? Is it an adequate way or are there other ways in which we should be developing research programs?

Mr Crockett—Most of the CRCs are involved in some way or another, either as EBA members or as a connection through affiliated groups, and I think the model of CRCs has worked pretty well. I was an adviser to the CSIRO Division of Chemicals and Polymers that incorporated the CSIRO's water sector activity in terms of treatment technology some years ago, and they had an outside advisory group. My only criticism of the CRC model is that excellent research is done but it is more at the scientific level and less at the applied level. In my experience, the best solutions and projects that get up integrate all of these levels with the practitioners. There are models on particular strategies or projects where, by getting groups from a variety of research, practitioner, operator institutions and supplier institutions together in a room to thrash out problems, the mechanism becomes a more effective one than the somewhat segmented and compartmented system. But otherwise, in getting research done and producing very good information, CRCs have worked exceptionally well, I would say.

Senator TIERNEY—Because of that government-private partnership nature, because they have to work on practical things and apply research, in a sense?

Mr Crockett—Yes, they do, but I think that can be taken further. They are probably too infrequently involved, because when it comes to actually implementing some sort of upgrade of infrastructure it is usually won by a consultant, such as ourselves, on a competitive basis. There is little funding to get the CRCs really and truly involved, so we tend to make decisions on low price all the way through and, as we said in the submission, it does not necessarily lead to the best outcome.

Senator TIERNEY—Part of that model was that CRC either gets a renewal after seven years or, like the photonics one, some become major commercial operations in their own right.

Mr Crockett—Yes.

ACTING CHAIR—Mr Crockett, could you comment on the Commonwealth's possible role in this? In your submission you advocate the use of major infrastructure projects as a way of getting best practice technology in place. Given that most of this infrastructure, particularly urban infrastructure, will be state based or metropolitan based, what role do you see the Commonwealth government playing in such projects?

Mr Crockett—We have used the analogy of when, in the seventies, the Cities Commission commissioned a number of studies along the Murray-Darling Basin. I think that model worked quite well. If you look at the water management strategies put in place for Albury-Wodonga, they have tended to be implemented over the years pretty much as they were originally conceived. It does not have to happen in the same way, but more and more practitioners look to

the Commonwealth through the NEPM process and the various ANZECC guidelines that come out, to provide the objectives, the benchmarks and the high level policy. Guidance and, in some cases, direct assistance for particular locations or types of projects can often be very beneficial. Where a state may have other priorities, the Commonwealth can take a view from further back and say, 'This is where we want to go nationally.' They might pick a particular urban area that is dealing with gross infrastructure failure problems or a new developing area where they can say, 'Let's develop an area where we really integrate water management.'

ACTING CHAIR—What you are proposing is that the Commonwealth takes a demonstrative or a 'champion' role?

Mr Crockett—I think the Commonwealth could, as could a state government. At the moment, my perception is that the responsibility for getting best practice up and running is fairly much split between local councils, developers and to some extent the state government regulators, with relatively little input from the Commonwealth. We have suggested that, if we could have a national ecological sustainability strategy in place, it would provide much more focus.

ACTING CHAIR—Regarding the funding for projects like this, earlier today we heard from one of the witnesses from the ACT who talked about their wetland project recycling waste water. They extracted some funding from the developer—an interesting use of words. Assuming that there can be voluntary participation, what are the benefits of public-private partnership models with this sort of infrastructure?

Mr Crockett—Public funding should go into schemes that meet long-term objectives and which would otherwise not get up on a straight economic basis. Direct government funding is one way where we can modify the way our economic system works to drive sustainability. Basically, any of these projects should be capable of being self-funding over their lifetime, except where we know there are hurdles to overcome that are beyond the capacity of the local authority or the developer to fund. There is a case for a limited amount of direct subsidy. But everybody is always after a subsidy, aren't they? So it is not necessarily the best way to go. You could end up funding some things that are not necessarily leading towards sustainability, if you are not careful.

ACTING CHAIR—Yes. Could you elaborate on the recommendations you make in your written submission for reforms to the taxation and depreciation laws which would encourage investment in environmentally sustainable technology?

Mr Crockett—Before going into that in more general terms, I will give you one example that I personally experienced. In the early 1990s, Australian firms were involved in bidding upgrades of all of Singapore's waste water treatment plants. These were all major projects worth hundreds of millions of dollars for about five of the sewage treatment plants on Singapore. American firms who were bidding for that often had consulting fees for each of the projects of about \$US10 million—some were higher, some were lower. The American government—and I saw the letter that was provided to American firms—simply said, 'We will subsidise your fee offer to the tune of \$US1 million—about 10 per cent of the fee.' Even though we have lower and more economical rates of pay than America, that makes it very hard for Australian firms—primarily Australian firms—to compete in the international marketplace.

Our level playing field is fine, but not everybody else, as we know, abides by that sort of philosophy. We have amongst the best waste water scientists, engineers and planners in the world. If you miss out on those sorts of jobs, even though you might have good offers submitted, through that lack of subsidy and government support or tied aid that goes with a lot of these projects, it means that local industry cannot develop to the same extent. We work in a very small marketplace; yet when big projects come up here, the chances are we cannot bring in best technology because it is too far away or it is too expensive because we have not had the opportunity to go out and demonstrate on some of these big overseas projects that we can do it better. So that is one aspect.

The EBA submission makes a comment on two things: taxation allowances on research and expenditure. I am not an expert in this. I do not participate in those sorts of funding applications—or very rarely have. It has been a very changing scene from full deductions and relatively small percentages—changing quite drastically as governments come and go. It is not a stable sort of thing. There is a need to be able to make some deductions to make this huge input of R&D that is necessary. In our submission we give the example of the Memtec process. Memtec was a water treatment technology using membranes developed originally within the University of New South Wales and developed very capably by a small private organisation called Memtec. They did moderately well in Australia within the constraints of our small market and our conservative approach to things. Many of the major water companies are reluctant to try new technologies. Memtec did surprisingly well in the USA over a relatively short period, but because the R&D necessary to keep up the development of what was a good concept and keep ahead of the market fell away, Memtec was taken over by a multinational that had other technologies that were similar and R&D into the Memtec ideas just dropped right away. We might have been able to keep Memtec as largely an Australian based and actively developing entity if there had been better deductions for R&D funding.

The other thing is accelerated depreciation. Where it is allowed, it can have a profound effect on the way people invest in much better technologies much earlier than they would otherwise have done. I do not pretend any additional expertise. I would have to take that question on notice and put it to other EBA members.

ACTING CHAIR—I would be grateful if you would. I was going to suggest that to you, because it is one area that you touch on but do not elaborate on at all. The committee is due to report on 27 June, but we will be requesting the Senate to extend the reporting date to 29 August. So there is plenty of time for you to send your further submission to us. If you can think of other things you feel you should have mentioned or that you would like to mention, please drop us a line and we will look into those aspects as well. Is there anything else you would like to say?

Mr Crockett—No, I think I have said all that I wish to say.

CHAIR—Mr Crockett, thank you very much for your evidence today.

[11.53 a.m.]

WHITTLE, Mr Brett (Private capacity)

ACTING CHAIR—I welcome Mr Brett Whittle via teleconference. The committee has your submission from last year, which we have already published. Would you like to make any alterations or corrections to that written submission at this stage?

Mr Whittle—Only minor points which I will probably discuss and highlight during this session.

ACTING CHAIR—The committee prefers all evidence to be given in public, but should you at any stage wish to give your evidence, part of your evidence, or answers to specific questions in private, you may ask to do so and we will consider your request. I invite you to make an opening statement before we move to questions.

Mr Whittle—The paper was stimulated by my experience of teaching in a newly built public school. I was struck by the poor environmental design and performance of the building and the grounds. The effect on student attitude and behaviour was quite clear and directly related to this poor environmental performance. The paper considered how environmental awareness and behaviours are developed and transmitted by structures and established practices. In examining the water use patterns of the school and keeping in mind social and environmental influences or consequences of these practices, the paper identifies five flawed or dysfunctional practices. It could go on to find a lot more, depending how pedantic you would like to be. I will briefly list them.

Firstly, there are cheap drinking taps which leak and require constant maintenance. The effect on attitude is essentially that it is a cheap resource and it is a low priority as these taps are always dripping. Secondly, there is the lack of timed watering devices, something which, particularly during summer periods, causes flooding to grassed areas. The school was trying to keep grass areas looking green. Essentially the clay soil and the land around were not appropriate for that. Thirdly, there are inappropriate plant species which require high water consumption—or large grassed areas, as was stated. Then, significantly, there are stormwater downpipes, which discreetly and I suppose efficiently, divert the water straight into the sewage lines.

One of the key points I would like to make is that, with a relatively small funding contribution, schools can use this resource to water gardens, create landscaping features, store water for later use on grassed areas, gardens or small crops and develop aquaculture activities which can be used by a range of year levels to meet CSS outcomes. They are all highly practical. For example, imagine a free-fall system from a roof into a pond below which could be less than a metre deep. One pond per downpipe could provide a range of aquaculture activities—you could have rice growing, eels, fish, whatever—which could be student led. The storage facilities could be used as recording devices or to provide water for flushing toilets. Gravity fed water pumping up to higher than roof level storage is possible. It is a simple technique of head pressure and volume reduction. Students could resolve a range of these

options as outcomes of the VET—vocational education and training—programs. In the last five years certainly there has been quite a push to expand these programs. The opportunities are quite broad. The visual impact of these initiatives would be significant, moving from formality and uniformity towards functional practicality, changing the perception of students and the wider community. The overarching effect of these initiatives would be to change the perception of water as a waste product to one of water as a resource. To develop processes with students, we would seek alternative uses for water as a valuable resource, considering the social impact on wasteful practices when public schools go to such lengths to preserve, collect and use rainwater wisely. I am arguing that this would be a highly visible thing which would affect both student attitude and that of the wider community.

Turning to my key recommendations, legislative or federal actions would be one way of requiring new public buildings to meet strict environmental performance guidelines or green design principles such as passive solar or low embodied energy water consumption. As I have identified, the running and maintenance costs of current approaches are not sufficiently considered in initial designs and reinforce poor environmental attitudes and awareness. As was listed in the paper, there is heating and airconditioning in poorly insulated rooms and cheap drinking taps which often leak and require maintenance.

A second recommendation is that a program be developed to encourage and reward schools for using water resources innovatively, reduce use, redirecting and reusing wherever possible. This is one of a range of practical, vocational, economic, social and environmental benefits. Schools have a key role in building social capital and such a program as suggested here would reassert this role. Other actions include encouraging native indigenous planting and landscaping of schools; discouraging water intensive designs and practices such as large grassed areas and inefficient watering practices such as those timers which we mentioned earlier; retrofitting public buildings to maximise resource conservation; and removing structural disincentives such as cheap water and cheap waste water disposal. In summary, the key element in these initiatives is to bring about social change, to move attitudes from perceiving water as a cheap, valueless commodity to a precious valuable resource. That is the inherent message in that paper. I am happy to answer questions.

ACTING CHAIR—Thank you very much, Mr Whittle. I neglected to say at the beginning that the quality of your submission is very impressive. Also, in previous lives, Senator Tierney and I were geographers, and in his case also a teacher, so we appreciate a lot of the issues you have raised here.

Senator TIERNEY—Winston Churchill once said that architects shape our environment and the environment they shape then shapes us. I assume from what you are saying you want children to pick up virtually almost by osmosis certain environmental values that would be in the design of the schools and then, by observing those things, as they move on through life change their attitudes and practices relating to the environment. Would that be a fair summary of what you are proposing?

Mr Whittle—I would certainly suggest that their current attitudes are formed by the current practices and that there is a desperate need to change those current practices to bring about that change in attitude. So, yes, essentially. Include in that notion you are mentioning that the current practices are affecting attitudes in a negative way, reinforcing those wasteful attitudes.

Senator TIERNEY—From your submission I take it that you came to this view because of a relatively modern school that you are at that did not incorporate such practices. How old was that school, or when was it built?

Mr Whittle—It is around seven to eight years old now. It is in an urban sprawl area of Hoppers Crossing. That whole area has developed quite quickly, so admittedly I could be quite critical of the majority of buildings that are built in that area from an environmental perspective. It is certainly the lowest priority, if you like. It was quite disappointing to see such a new building with such poor inherent design built into it.

Senator TIERNEY—So, given that that is a mid-1990s building when the technologies were around to do the things that you are suggesting, why do you think whoever built those buildings, whatever government department it was, was not following best practice? What is the reason, do you think?

Mr Whittle—I would put it down to the perceived economic value in getting a building up quickly. The buildings themselves from a distance are visually impressive. They look neat. There is that sense of formality. The same thing applies to the landscaped gardens. The notion with the landscaping was to put in semi-established plants so that as soon as you do the landscaping things look good. It is the same with the buildings. You want that instant visual, practical useability at the lowest possible cost.

That comes as a consequence of not considering the inherent environmental factors that are in that area. The school itself is built on clay, and yet there is a large use of concrete. Now, seven years on, in numerous places throughout the school, the concrete is shifting. The concrete shifts and you end up with two-inch high gaps between the breaks in the concrete. It is an inherent part of clay that it was going to do that. The cost of that this year has been two TVs. The TVs are dragged from the library around to the classrooms when video materials are being used. There is damage and cost there. The same things apply to the water intensive nature of those established gardens. There was no consideration of using indigenous plants, and the same goes for the buildings.

The other point I would like to mention is that last year there was the initiative of ensuring that schools have airconditioning so that each classroom has fans or airconditioning. The department of education subsidised these and, again, put little thought into the types of airconditioners to be used or ways to make it more efficient. They are simply putting airconditioning in very poorly insulated buildings.

Senator TIERNEY—If they implemented your ideas, would that significantly add to the cost of the building?

Mr Whittle—No, certainly not in the long term. In the short term, no. I would have to say that depending what materials—

Senator TIERNEY—It is just a matter of the way of doing things.

Mr Whittle—That is right.

Senator TIERNEY—You can do it this way or that way, and they chose not to do it in an environmentally sensitive way?

Mr Whittle—Yes.

Senator TIERNEY—Are you proposing that this be done in all public buildings or are you just focusing on schools?

Mr Whittle—In all public buildings would be fantastic. As an environmentalist it makes absolute sense that public buildings, when developed, should be incorporating green design principles. Passive solar is such a simple design technique to include in a building and makes such a difference to the heating costs that it seems rather ironic that we do not pursue these initiatives. Instead, the focus is very much on establishing a building quickly and cheaply without considering the longer term costs of running and maintenance of those buildings.

Senator TIERNEY—Your two objectives are to have more environmentally sensitive buildings designed and for school children to pick up values relating to that. Are you aware of any research into that relationship between school environment and resulting values?

Mr Whittle—I certainly know of existing examples. Ones that come to mind are the Rudolph Steiner schools which explicitly design their class rooms around environmental principles and the needs of the people using them, and also the work of Greg Burgess, a fairly well-known architect who certainly does follow those principles and incorporates them into his design. Another example which comes to mind is the Chinese tendency of feng shui techniques in their design of buildings. It is an established thing and I am unaware of how much research has gone into acknowledging the impact of building design on the occupants. The examples are more anecdotal. I am not aware of a large amount of research, other than an overwhelming number of practical examples.

Senator TIERNEY—Thank you.

ACTING CHAIR—Mr Whittle, one other thing that Winston Churchill did not realise was that architects are actually shaped by accountants and bureaucrats, so we have other hurdles to overcome, I think. Your second recommendation is that we should develop an environmental program that would more or less educate children in their school environments. Have you given any thought to how to design such a program?

Mr Whittle—Certainly. I think it fits quite well with the VET program, which is, as I mentioned, a recent and well funded promotion in schools. What usually happens is that students go elsewhere to do their practical work; they usually go out to a business or whatever. I suggest that some of that funding be directed to enable the work to be done on schools themselves. There is a range of options which can be pursued. I certainly have a fairly clear vision of how such a program could work and function. I suggest that the costs or the value in it—both in the short term and in the long term, with the range of benefits, as I mentioned, such as vocational, economic, social, environmental, using less water, getting people thinking about the value of water and how we currently waste it—is certainly highly practical and very achievable.

ACTING CHAIR—If it does not take up too much of your time and resources, can you jot down some of these ideas, perhaps in dot points form—you do not have to elaborate too much—and send them back to the committee?

Mr Whittle—Certainly.

ACTING CHAIR—We are scheduled to report on 27 June but the proposal is to seek an extension to 29 August, so we have plenty of time. If you could do that, it would be very much appreciated. I think those are all the questions I have for you, except for something which is probably irrelevant: where is the Grange Secondary College?

Mr Whittle—The Grange is in Hoppers Crossing, which is a suburb in the outer western area of Melbourne.

ACTING CHAIR—But you live in St Kilda East?

Mr Whittle—Yes, that is true. I take the train and ride my bike.

ACTING CHAIR—I see—the environmentally friendly approach.

Mr Whittle—Indeed, yes. The area I teach is outdoor environmental studies and I do my best to make my practices noteworthy to students.

ACTING CHAIR—I am glad you take the train. I did not like the idea of you riding every day to Hoppers Crossing.

Mr Whittle—Yes, that would be a bit physically draining.

ACTING CHAIR—Thank you, Mr Whittle. Please stay on the line after this session is finished in case Hansard have any questions for you about some of the words you have used or some details that they need clarification on.

Mr Whittle—Certainly. Thank you for your time.

ACTING CHAIR—Thank you for your time, Mr Whittle.

[12.14 p.m.]

BOTT, Mr Geoffrey Michael, Director, Water Quality Section, Environment Australia

GARLAND, Ms Marion Joy, Assistant Director, Water Quality Section, Environment Australia

HOOY, Mr Theo, Acting Assistant Secretary, Environment Australia

ACTING CHAIR—I now welcome the representatives of Environment Australia. Perhaps I should say ‘welcome back’ to Mr Bott and Mr Hooy because you both appeared at our previous hearing in Canberra on 22 March. As we foreshadowed then, we have asked you back today to give us a chance to test you—perhaps not to ‘test’ but to ask you to comment—on some of our findings and preliminary conclusions. I should also say that we have visited several projects around Australia for which Environment Australia has provided funding and the responses have been almost—I need to stress ‘almost’—universally supportive.

As you know, the committee prefers all evidence to be given in public, but should you at any stage wish to give your evidence, part of your evidence or answers to specific questions in private you may ask to do so and we will consider your request. As you are also aware, as departmental officers you will not be expected to answer questions which invite you to express a personal opinion on matters of policy and you will be given reasonable opportunity to refer questions to a superior officer or to a minister. I will now invite you to make an opening statement and answer some questions later.

Mr Hooy—Given that this is a follow-up meeting, I do not propose to offer an opening statement. We welcome any questions the committee may have.

ACTING CHAIR—When I refer to this almost universal support, because of the competitive nature of gaining Natural Heritage Trust funding, grants are often awarded to those applicants who have greatest resources to prepare applications rather than to those with greatest need. This is obviously from some of the unsuccessful grantees. I might add that this is a comment I have heard related to other Commonwealth grants as well. Given that we have heard this sort of complaint or comment, would you like to make some comments on that?

Mr Hooy—Yes, it has been a perennial problem, but from the Commonwealth’s perspective it obviously needs to be mindful of the fact that funding should go to the best equipped organisations. There have been instances in the past where groups have obtained funding and in effect the project has been beyond them. The harsh reality is that the better project applications are generally a good indication of the capacity of an individual organisation to have thought through what the issues are and to have come forward with a coherent approach and a submission to address the problem. It is an ongoing problem, but in that context I would point out that with the second tranche of NHT there will be provision under a component of that called the Envirofund which is looking at providing relatively small grants for community groups as almost entry level to get into the funding cycle, gear themselves up, develop their

skills and hopefully later in the piece become part of an organised regional application for funding.

ACTING CHAIR—That is a very positive move, but I must say again that a lot of the complaints actually related to the ability to fill out or prepare the submission rather than the actual resources behind it. It is almost a skill of preparing the paper rather than the skills of delivering the project that are being taken into account. Has the department thought about how to counter that?

Mr Hooy—The Commonwealth provides significant funding for various facilitator networks. Under NHT1 we had Bushcare facilitators, we had Landcare facilitators and we had Waterwatch facilitators, and part of their duty statement job description has been to assist community groups in making applications and developing applications so that as much as possible it is a level playing field and projects are assessed on their merits rather than on how slick or sophisticated a project application looks.

The other thing is that it is not a one-dimensional process. The applications do not come automatically to the Commonwealth. In the past, project applications have been assessed by regional assessment panels, by state assessment panels, and then they have been put forward and looked at in a national context. In effect, what we have set up is a process of peer review. There would be very few projects that came before a regional committee where the proponents and the issues to be addressed were not known by the regional assessment panel. That, to my mind, is a very strong counter to the accusation that only those people who put in glossy applications or weighty tomes get a look-in in terms of funding. There is that neighbour, peer review process before projects are ranked and passed on to the state assessment panel. That is a very good way of ensuring that projects do get up on merit, not just on how they look.

ACTING CHAIR—During our program of hearings and site visits, we have noticed that most of the projects related to improved management of urban water seem to involve some sort of NHT funding. While in one sense that is very good because it shows that the Commonwealth's input has been very effective, it is also worrying in the sense that the NHT seems to be the sole driver in this area. Is that a true reflection of the situation and, if so, what can the Commonwealth do to encourage the states and other players to adopt integrated urban water management measures without the input of Commonwealth money?

Mr Hooy—I will make a couple of comments and then hand over to Geoff. He may have some specific comments. Once again, it is one of those things that occurs not just in the water area; I have had extensive experience in the past with vegetation programs—Save the Bush, Bushcare et cetera. I suppose the problem has been that the problem has always turned out to be bigger than we expected, so our goal and intention has always been to provide catalytic funding and to gear up the community in terms of expertise, enthusiasm and ability to access private funding, for example. We have done that, but every time the science has come back and said, 'No, the problem is bigger than we initially thought,' and so we have always been chasing our tails on that front. Geoff could comment specifically about water programs.

The intention has been that the Commonwealth should not be the permanent solution to addressing natural resource management. This is about capacity building, not just at the community level but also at state agency level, to get them to recognise a problem and be

skilled up. The problem has been that the targets keep moving out; we have had to keep following the targets, and the only way we have been able to bring the community up to the next level has been through continual injection of funds.

ACTING CHAIR—What about state government cooperation or state government input?

Mr Hooy—State government input has generally been very good. As you would be aware, under the Natural Heritage Trust there has been a commitment from them to match Commonwealth dollars in cash or in kind. We have been particularly careful to ensure that there has been no cost shifting in the state agencies. That is obviously a very difficult thing to measure, but we have tried as much as we can to ensure that there is at least an equivalent effort from state governments to help us work with the community to address these problems.

Mr Bott—I would like to add a few points. We often find that some of the major impediments to water use efficiency and water demand management in urban areas are not to do with funding per se but with institutional and statutory reform aspects or capacity building aspects. That is, the existence of various technologies is not well promoted, nor is their cost or their efficiency in removing pollutants, for example.

That is one area where we are particularly active: funding innovation and new technologies, demonstration of scale of those technologies, and promoting the transfer through a number of media—web pages, newsletters and various other fora. The notion that there may be a funding impediment there is valid, but I would suggest that you look at some of the institutional statutory reform aspects, which I would add are a key aspect of the extension of NHT2 in itself.

One of the other aspects that we commonly encounter when dealing with things like waste water reuse or stormwater reuse is fragmentation of the management roles. You often get fragmentation of the roles and responsibilities across government agencies. For example, you may incur environmental approvals, environmental impact assessments and health approvals by local government or state government agencies for reuse of domestic waste water. You often have a drainage manager who is different from the drainage approving authority, so drainage design is done by someone other than the operator. In a lot of cases that may be devolved down to local government, so you have a rating, economic, aspect to it as well, and that makes providing for environmental infrastructure per se quite difficult.

Again in terms of those impediments, risk management is a key issue. These technologies and approaches are quite new and can often have a degree of site specificity about them. Drainage managers are very hesitant to put in multimillion-dollar capital infrastructure if they at all think it may not work. One of the key ways around that, which we have inspected first hand, is Melbourne Water's approach to actually underwrite these innovative technologies. They say to the developers, 'Look, if it doesn't work, we believe in it so much we will pull it out and we will put conventional in.' For the particular development in hand, Melbourne Water put \$10 million on the table and said, 'We're going to underwrite this, we believe in it so much.' That is a fundamental aspect of overcoming some of those impediments and those hurdles.

ACTING CHAIR—It has been reported during our hearing that quite often disagreements with the states over funding have delayed the spending on NHT programs. In fact, earlier this week there was some disagreement between Mr Kelvin Thomson and the minister about that.

Can you comment on the current status of negotiation with the states? Do you think that the partnership model of natural resource investment still works, or do we need to develop some new strategy?

Mr Hooy—I would like to preface my comments by saying that the specific issues that you mentioned in terms of delays will be addressed, I suspect, at Senate estimates next week. It is not really an area that we have geared up to talk about. Having said that, I will make a couple of comments anyway. There have been a number of instances right across the Natural Heritage Trust where payments have been delayed. In most cases, there are good reasons for that. Once again referring back to my vegetation experience for example, we have had a number of years in a row where we have had community groups geared up to plant trees and what have you, and we have had an El Nino effect. Clearly, planting trees in that sort of environment where you cannot water them would mean they would die. The community would have put a lot of work in, and they are much less likely to do it next year.

The other thing, of course, is that there are lead times associated with growing trees. For example, if a community is putting trees in the ground, the numbers that we are talking about just cannot be bought from the local nursery. In effect the community has to put in a grant application. They then get an indication of the funding and approach a tree grower, if they are talking about a tree planting. There is at least a 12-month delay there with tree growing. What happens then is that you are hit by a dry year and you cannot put anything in until the following year. The problem with Australian natives, if they are delayed again, is that they become overgrown so they are in fact almost too mature to go into the ground. There is potential for losses there. That is just on the vegetation front. Geoff will be able to give you some examples of water related issues where there have been delays. One that has taken my fancy is a community group that was set to go with a project when a Macchi jet exploded over the site. Delays range, essentially, from acts of God to a Macchi jet explosion—which I suppose is an act of God.

There are other things. For example, we will get a proposal in which is a very good proposal. It is ticked off and initial funding is set to be provided, and then we find that the community has not received state or local government approval. There may be a 12-month delay there. There is a whole range of reasons why project funding is delayed and why obviously it would not be appropriate to continue. Geoff might have some specific examples.

Mr Bott—These are the sorts of things which drive contract managers to distraction. It is just an aspect of dealing with innovative technology which we aim to promote. A lot of those technologies are unproven and untried in local conditions and, indeed, in some cases within Australia. There is obviously a point of finetuning in that which can add to delays. There are things like site surveys, which always add to the delay. You need to do the soil profile and get an understanding of what the site looks like. Weather constraints are a key one, particularly in northern Australia. It is just not possible to turn the ground during the wet season. We have environmental health approvals, which Theo has alluded to, which can be a significant one. In fact, when we are dealing with waste water treatment technologies we have a number of cases where state authorities have not known of the new technology and therefore did not have a policy to cover the particular approach. That led to quite extensive delays in environmental and health approvals.

With contractual negotiations, we often aim to use consortia in these approaches to waste water stormwater management, for example. That often involves industry, local government and agencies. At key points in the contract negotiations you might have one or more parties withdraw and put you back to the negotiating table. That can be quite a key one, particularly with local government on budgeting cycles. They are just an example of the sorts of standard things with any contract management. As I say, it does drive us to distraction at times.

ACTING CHAIR—Yes, I appreciate that. Thank you for clarifying that. I am sure that sort of question is being asked all the time. As far as contracting is concerned, one suggestion to improve the NHT grants process is that, instead of having fixed nominated terms and size of grant, the Commonwealth perhaps invest in specific outcomes in plans developed by the regions or local communities. In other words, the eventual grants would depend on the success of the plans. This would give a better contractual outcome where payment would depend on results. Can you comment on the merits, or otherwise, of this approach?

Mr Hooy—The Commonwealth pays on milestones—in effect, outcomes. Every project has a series of stages.

ACTING CHAIR—But these are fixed outcomes. What I am getting at is that some people are suggesting that if they achieve above outcomes, or below, then the payment would be in proportion to that and reflect that.

Mr Hooy—I can assure you that, if they do not come up to scratch, payments are looked at very closely. If they exceed outcomes that is delightful, but we obviously have to operate in a highly competitive budgeting climate and, given the vagaries that we have just discussed in terms of our last response, the thought of adding in a third or a fourth dimension of complexity is quite alarming, to be frank.

Having said that, in terms of the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust, the Commonwealth is moving to fund investment strategies developed under regional plans. In my view, that will give a lot more flexibility to do as has been proposed. A regional body would put up an investment strategy in which they would talk about a whole series of actions and, of course, we would look at the outcomes that are expected. In my view they would have a relative amount of flexibility to reward those projects that are bearing fruit early in the piece or those that show real promise, compared with others that, for whatever reason, may still be okay and plugging along but not really delivering at the highest level. The new regional approach where standards and targets are mandated and agreed does give us a lot of confidence that we can invest our money in an outcomes oriented environment rather than in a straight funding of project type of proposal.

Mr Bott—Adding to that, the government has obviously made commitments to improving coastal and urban water quality, particularly with reference to coastal and urban water quality hot spots. Also within those commitments is the undertaking to measurably reduce pollution discharges to coastal waters. That is an area we are currently looking at under emerging funding systems. But I think it offers an opportunity. Previously, one of the problems we have faced with Commonwealth funds is prioritisation or context for projects. Often it is not by solicitation; it is a general call for projects, which we get in varying degree of quality and significance, and it is

very difficult to prioritise them without the context of a water quality improvement plan or an NRM plan, or some other context-setting strategic instrument.

As I suggested, we cannot develop project submissions for funding in our own right. We are always reliant upon someone to put in a submission under the existing NHT1 structure. Under emerging frameworks with NRM plans and accreditation of those plans, if a local government sees a stormwater/wastewater issue as a priority, and it is recognised within the region as a priority, we would expect it to gain prominence in the NRM plan and thereby be eligible for regional funding under extensions of NHT2 or NHT.

One of the other aspects to that context setting for individual projects, and the funds thereto, relates to the matter Theo raised regarding targets. The objective is to measurably reduce pollution discharges to coastal waters. We would like a target on that—an agreed nominal amount up front of, say, a 30 per cent reduction of X within a certain time frame. That in itself will lead to development of actions to attain that target. We are looking at the costs of those actions and their effectiveness relative to attaining that target. I think some of those sorts of benchmarks or frameworks for priority setting would greatly enhance the current investment systems. I would hope that, in time, we would get to the point where we could demonstrate how much money had been spent, in a percentage way what amount of pollution had been reduced and how many dollars per kilo of pollutant removed that actually equated to as some indication for future spending commitments in terms of cleaning out coastal waters. That sort of information is not gathered in a systematic way and I think it would value add in the longer term to be able to demonstrate the cost-effectiveness of various approaches and technologies.

ACTING CHAIR—While the committee was in Queensland, we heard submissions from a group called the Sunshine Coast Environment Council. This council has a voluntary community group and they have developed a prize-winning education program. They complained that they could not get funding from NHT. At the time, I made the observation to them that the whole NHT is an education program, but that was flying by the seat of my pants a bit. I would like to hear your comments on it. Does the NHT fund any education programs, or are there any particular types of programs?

Mr Hooy—We have, and we do. As Geoff just said then, our Waterwatch program is a very good example in the context of water. That program has engaged 50,000 people nationally in what is effectively an education program, although it has had some hard-edged outputs as well. That program has employed regional facilitators throughout the country to work with community groups, schools and what have you to raise awareness of water quality, train people up in water quality monitoring techniques and—more particularly, in terms of hard-edged outputs—enable them to record the measurements they obtained. They have been put on web sites and it is then open to other community groups, local government and state agencies to monitor that. That is a first-class example of community education.

ACTING CHAIR—The Sunshine Coast Environment Council's project was that they produced some WaterWise material, and they were looking for support from NHT to help them produce more of that and distribute it.

Mr Hooy—I cannot comment on the specifics of that particular bid, which I am unfamiliar with. All I can do is postulate some reasons they may not have been successful. One is that

there was possible duplication with what they were doing. They may not have identified a target audience sufficiently. They may have produced very good material but, at the end of the day, it is only as good as how widely you can distribute it and how well it is recognised. The other thing is that there have been very many applications to the Natural Heritage Trust to undertake community awareness raising training. We have had to balance that with the community expectation that NHT funds are expended for onground works. That is a pretty difficult and also quite a dynamic target that you are shooting for. On one hand, a lot of community education is catalytic and there are real pay-offs and benefits in the longer term, but as I said, we have to balance that with the community expectation that NHT funds will lead to some immediate, tangible onground works and onground change.

Ms Garland—Within the programs we fund there is very often a community education component. For instance, there are projects that involve Greening Australia and Clean Up Australia committees. So in a sense there are opportunities for those kinds of community groups to get involved—it is a matter of them knowing how to access those projects locally in order to become involved. Certainly, a large number of projects have community education components. It is just a matter of who does it. The high schools are very often involved; there are a whole range of people who are involved. I think it is more a matter of accessing those projects and becoming involved, rather than not doing so.

Mr Bott—The other side of that, that we have not really touched upon, is the urban water quantity issues—water use and water demand management in an urban sense. If you look at the latest press reports for Perth, which is in the grip of a water shortage at the moment—we are in sprinkler restriction mode—they have reduced water consumption by 25 per cent across the whole of the metropolitan area. In some suburbs, I think it is as high as 60 to 70 per cent. However, the flip side of that is that drought has basically precipitated that event in terms of reducing water use. One question is whether that would have happened if there had not been a drought. The response has been a reduction in water use which has put a significant dent in the state government's revenue streams, to the point where it is estimated that the reduction in water use has reduced householder bills by \$55 already. One would question whether, in that particular instance, the water utility would have been in the business of promoting water use efficiency knowing that the government revenue stream would have been reduced. It raises some issues about broader community awareness.

ACTING CHAIR—That is a question we raised with some of the water authorities before: if they are in the business of selling water—actually I think they raised it themselves too—what is the point in trying to save water? It would be a very unusual type of business that did. There is no financial encouragement for them to do that either. One of the issues which we keep coming across is water sensitive urban design and the implementation of that. There is no lack of water sensitive urban designs but nobody is building them. What do you see as the most pressing changes to legislation and institutional arrangements at both the state and Commonwealth level to give effect to those designs?

Mr Bott—As a little bit of background, in a previous life I was working on water sensitive urban design documentation in Western Australia, which is where the concept originated. It is also noteworthy that some 15 years later Western Australia is probably the least advanced state in terms of implementing water sensitive urban design. Notwithstanding that, the philosophy is very sound and it deals with things at scale between householder, suburb and subcatchment

scale. The philosophy is sound, but there are operational problems in making it happen across systems which are often fragmented in terms of roles and responsibilities—the issues I was raising before about health approvals and who designs drainage systems that go beyond the lot boundary into subcatchment scale. Those are often done by different players and trying to get integration on that is difficult. I think the way we look at the costings on that needs to change—the notion that you can pay me now or later needs to be built into the system, in that if we do not go in for these best practices in waste water and stormwater management now there will inevitably be costs further up the track relating to the remediation of our receiving waters or our drainage systems per se. That needs to be factored in.

The numbers we have from projects in Victoria suggest quite strongly that the costs of putting best practice in are no greater than the conventional costs of putting normal sorts of drainage stormwater systems in. I think at the moment that is based on a five per cent differential, which they say will disappear once broader uptake of the building or construction phases becomes more apparent. Basically, these are newer technologies and the tradesmen building these systems need to finetune the systems. The differential is, for want of a better term, basically nonexistent. I think people need to bear that in mind.

The notion of environmental infrastructure is something that needs to be promoted. We put in sewerage, power, telephone, electricity and whatever it may be—roads—when we build new suburban areas, designing them well in advance and rolling out the urban areas already carefully designed, but we do not deal in the same strategic way with water quality or quantity in those areas. There are often very abrupt changes in the sorts of approaches used when we hit administrative boundaries, be they physical ones—catchment boundaries or local government or health authority jurisdictions or whatever. In terms of changing those practices, one of the approaches we have used is to fund development through local government of model planning provisions. We have found that a very useful instrument. That is basically taking the philosophies of water sensitive design or best practice and putting those into planning bylaws—model ones—that are not site specific but are quite capable of being modified readily for uptake into planning systems.

From a personal viewpoint, one of the things I have noticed since being in Canberra is the energy rating system for households, which I think is wonderful. That means that whenever you advertise a house for sale or rent you must put the energy rating system at the bottom—the number of stars. I find that when looking for a house in quite a cool climate it is something I am quite mindful of; if the energy rating is half a star or something, the house might be quite cheap to rent but it is going to cost me a fortune in heating. Water rating efficiency would be a very useful adjunct to that, so that people were aware of where they stood in the grand scheme of things, at a household level or even a suburb level, in terms of those rating systems—to know whether you are actually using best practice or better practice and where you sit in the grand scheme of things. I think it is an awareness raising thing and it is not a huge cost burden per se—it is quite readily administered, and I think the ACT government can demonstrate that quite adequately—and it would be a very useful tool.

ACTING CHAIR—If the committee comes up with a recommendation that Environment Australia should prepare a policy paper on how to encourage or institute these types of institutional changes, we are in good hands. On the last occasion when you appeared before the committee you talked fairly extensively about the National Water Quality Management

Strategy, but during our inquiry we heard very little about this strategy from other witnesses in other submissions. Has this strategy, along with the COAG water reforms, been the underlying driver of change or are its effects still waiting to be realised?

Mr Hooy—I think we are trying to make it more user friendly.

ACTING CHAIR—That is very useful; that would be good.

Mr Bott—COAG requires implementation of the National Water Quality Management Strategy, which sounds fine on the face of it, but in an operational sense the National Water Quality Management Strategy is a compendium of, I think, 21 or 22 volumes dealing with waste water reuse and stormwater management. There is some good guidance in there as well as water quality management issues generally. At the moment, we are at the crossroads of trying to get that implemented. It was published mid last year, and we are currently looking at how best to take up the strategy within things like NRM and catchment planning per se. To date, the emphasis has been on publishing the document, and we are in the middle of transition into a phase of looking at the concepts of principles within it and how to bring those to the fore through programs.

ACTING CHAIR—And making people read it.

Mr Bott—It is more than making people read it; it is making people understand it and apply it in a simple way.

ACTING CHAIR—What do you think of the idea that all new Commonwealth buildings, whether we build them, fund them or rent them, should comply with designated world efficiency standards in order to set a good example and establish expertise and so on?

Mr Hooy—I do not know that we really want to set Commonwealth policy here. Geoff might be a bit more au fait with the John Gorton Building and the systems that were in place there.

Mr Bott—The John Gorton Building, the home of Environment Australia, was designed with those sorts of concepts in mind. There is a degree of on-site waste water treatment and reuse, and a degree of that ends in the main sewer system. But that is a restriction on the capacity of the building, basically—the number of people and the generation rates and the area to irrigate. So it has been designed with that in mind. What I would draw parallels to would be things like government buying policy on recycled paper products and energy use efficiency policies. Water would seem to be complementary to those sorts of initiatives. I am well aware that in the United States there is very broad level national government policy which deals with such matters as purchasing policies on recycled products and water use efficiency, and reuse of manures and composted material. It covers quite a broad level. There are some models which you might like to look at.

ACTING CHAIR—The previous witness was saying that new school buildings should be built with water-sensitive designs. As these schools will be partially funded by the Commonwealth, perhaps there is an opportunity to do something there. What about retrofitting existing buildings with water saving devices?

Mr Bott—You can get quite significant water savings doing that.

ACTING CHAIR—Is that a good idea? Should that be a Commonwealth policy as well?

Mr Bott—In these things, I would probably start with the new urban areas, because I think it is easier, and have a facet of retrofit in time. It is a lot harder to actually do that. I am well aware of the dual-flush systems issue, particularly in Western Australia. Eventually, the building by-laws were changed such that new houses had to have dual-flush systems in them. In time, they changed the plumbing code, which required plumbers, when installing systems, to ensure they were dual flush. That meant that, in time, when systems broke down or people wished to renew them, they had to put the state-of-the-art in and not go to a single-flush system. That is a nice, easy way to do it. There are other incentive programs that could be seen as analogous such as the introduction of appropriate technologies on a buy-back scheme or a trade-in scheme where you can trade in a shower rose and get a low-flow showerhead at a reduced cost as part of the deal. There are plenty of models around which suggest that would be quite readily taken up by a certain percentage of the population, but in time I think there would be a residual which you would have to address. I would tend to deal quite differently with the new and the existing in a management sense.

ACTING CHAIR—One of the problems with retro-fitting is that there is always the problem of balancing water saving at the micro level and water saving at the macro level. If you have the macro system in place, you actually do not need this micro level and it becomes a wasted investment. But I suppose it still comes back to public policy and when to make the investment. It has been suggested that the Commonwealth should consider developing further national standards and water efficiency ratings for plumbing and water devices that can be included in the Building Code of Australia in order to provide a basis for best practice in building and in retro-fitting. Can you comment on that?

Mr Hooy—I stand to be corrected by Geoff, but traditionally that has been the domain of the states. They provide the licensing regimes, the regulation regimes and what have you. Whilst the Commonwealth could, and has been seeking to, facilitate the whole area of water reuse and appropriate direction of stormwater, we really cannot unilaterally move into that area without the states' complete agreement. As I said, they have the regulatory inspection regimes and what have you, and we really would need to bring them on board.

Mr Bott—It is also the simple matter of the use of the term 'standard' as well. Standardising those sorts of technologies nationally may not be practical. For operational reasons, you may have low mains pressure and not be able to use a low-flow showerhead, for example. Although the notion is supported, there would need to be a degree of flexibility within that system so that you could customise what you were using in any specific location.

ACTING CHAIR—We did hear comments that industry-set standards are probably better than government-set standards. I have a few other questions that are probably outside the committee's terms of reference relating to catchment management mainly in the rural setting. I will skip those, because I might be treading on someone else's toes. Thank you very much gentlemen and Ms Garland. I think you answered all my questions, except for the question on what we should do about changing rules. This concludes today's public hearing and our inquiry. We will now start work on preparing our report to the Senate which is planned for tabling on 29

August. I thank everyone for their attendance and cooperation today. I thank Hansard and the committee secretary.

Committee adjourned at 1.00 p.m.