



COMMONWEALTH OF AUSTRALIA

## Official Committee Hansard

# HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND  
FORESTRY

**Reference: Future water supplies for Australia's rural industries and communities**

WEDNESDAY, 28 MAY 2003

Canberra

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**HOUSE OF REPRESENTATIVES**  
**STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND FORESTRY**

**Wednesday, 28 May 2003**

**Members:** Mrs Elson (*Chair*), Mr Adams (*Deputy Chair*), Mr Forrest, Mrs Gash, Mrs Ley, Mr Schultz, Mr Secker, Mr Sidebottom, Mr Windsor and Mr Zahra

**Members in attendance:** Mrs Elson, Mr Forrest, Mrs Ley, Mr Schultz, Mr Secker, Mr Sidebottom and Mr Windsor

**Terms of reference for the inquiry:**

To inquire into and report on:

The provision of future water supplies for Australia's rural industries and communities, particularly:

- The role of the Commonwealth in ensuring adequate and sustainable supply of water in rural and regional Australia.
- Commonwealth policies and programs in rural and regional Australia that could underpin stability of storage and supply of water for domestic consumption and other purposes.
- The effect of Commonwealth policies and programs on current and future water use in rural Australia.
- Commonwealth policies and programs that could address and balance the competing demands on water resources.
- The adequacy of scientific research on the approaches required for adaptation to climate variability and better weather prediction, including the reliability of forecasting systems and capacity to provide specialist forecasts.

**WITNESSES**

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**Committee commenced at 5.10 p.m.**

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

**GOSS, Mr Kevin Frederick, Deputy Chief Executive, Murray-Darling Basin Commission**

**CHAIR**—I formally welcome the representatives of the Murray-Darling Basin Commission to our committee hearing. Thank you very much for your very detailed submission. We are all very eager to listen to anything you might add today, plus we have some questions on the submission. We all know how important the Murray-Darling Basin is, especially to our environmental flows. It has been such a contentious issue for many years. So we look forward to listening to you today. Although the committee does not require you to give evidence under oath, I should advise you that these hearings are formal proceedings of the parliament and consequently they warrant the same respect as proceedings of the House itself. It is customary to remind witnesses that the giving of false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Would you like to make a brief statement or make some introductory remarks before we get into questions?

**Dr Blackmore**—I would love to. Firstly, from the commission's perspective, we are delighted to be here and to have the interest of the federal parliament in water. It is a scarce resource in Australia and will continue to be that. The way we as a community elect to manage water on this arid continent will define us. So, from our perspective, we are delighted to see that interest. We wish you well with your inquiry. We would be pleased to do anything we can—in the way that we create knowledge and participate and work with six governments; that is a bit interesting in itself—to help you in your deliberations. We do not profess to have all the wisdom about water, but we do worry pretty extensively about what is happening in our world.

Can I just make five or six opening remarks which might put this submission in context. Firstly, Australia has less than one per cent of the world's water. That is a defining issue for us. We have the highest variability of rainfall on earth and the highest variability of stream flow on earth. As a consequence, that has driven us to invest huge amounts of money in storage to provide security. In fact, our investment in storage is way beyond anything that has happened anywhere else on earth, just simply because of the nature of our continent. So the investment that we as a community have all made in trying to secure water supply has been very substantial. To give an example, in our basin we have an average flow in all of our rivers of a bit over 24 million megalitres, as you will see in the submission, of which about 11 million megalitres are consumed. The rest of the flow is used to run our rivers and some of it, about 27 per cent, goes to the sea.

But the critical issue is we have 38 million megalitres of storage capacity in this basin. We have 50 per cent more storage capacity than the average annual flow of every one of our rivers. Of the amount of flow we divert, we need to store 3½ times that amount of water to secure our water supplies. If you were in England, that number would be less than one; in fact, it would probably be about 0.4. So that has put a cost burden on our industry in terms of the construction of storages, and on individual farmers in terms of on-farm dams and on-farm storages, which is quite different from what the rest of the world has had to experience.

A consequence of our highly variable rainfall is that we get periods which are an absolute trauma for all of us. Most of our communities are going through an extraordinary drought. We hope that within the next couple of weeks we will start to see a decent autumn break and a turnaround; otherwise, we all will be in absolutely uncharted waters to survive.

That has raised the issue of what do we do about balancing. Do we have the balance right for sustaining our rivers? I do not like to use the words 'environmental flows' because it is a currency which is not all that useful. We are trying to make sure that the services we need from our rivers can be sustained and trying to determine what flows we need to do that. Queensland have come into this later than everybody else. They have largely said that at the end of their river systems, where water flows into another state, they are going to deliver about 60 per cent of the original flow characteristics of those rivers. That is pretty much what they have done, all except for the Condamine-Balonne, which is about 46 or 47 per cent, and a debate is going on about whether that is right or they should raise it.

New South Wales rivers are all below that in end-of-system flow. The major rivers, the Murrumbidgee and the Goulburn rivers, are at about 37 per cent of their original flow characteristics at the end, as measured as median flows. The River Murray, at the other end, is now at 27 per cent. That is from where we export nutrients and salt. We generate three to four million tonnes of salt in our system a year, which we have to either store within the landscape in the basin or dispose of somewhere. So we need in our system the capacity to remove that or an alternative to store it. At the moment we are pumping 1,100 tonnes of salt away from the River Murray every day. We are investing another \$67 million or \$68 million to pump another 900 tonnes to buy the next 15 years of salinity management so that we can get our catchment management in the Murrumbidgee system, the Goulburn system and the Namoi system in order. I do not think we can get there.

**Mr SECKER**—What do you mean when you say you are pumping the salt?

**Dr Blackmore**—We have ground water bores adjacent to the River Murray that intercept ground water that would flow into the River Murray.

**Mr SECKER**—Salt interception.

**Dr Blackmore**—Yes. In Mr Forrest's area, we pump surface water and so on. We will get to the contentious issue of evaporation at some stage. We are pumping a large amount of water. In our basin we have largely stabilised water use between the states, except for a small issue with Queensland which I believe will be resolved within the next couple of years as that community solves their own problem, basically. The only other community in the basin that will not be capped is Canberra. Canberra does not use very much water compared with the rest of the basin. We deliver the volume of Lake Burley Griffin on average every day. That is the consumptive use within our basin. The volume of water Canberra uses is equal to one Burley Griffin and about 20 per cent. So that is the scale of the operations.

Just to follow the line through, we are in a debate now about what is a healthy working river—that is the terminology we are using; that is what our governments have told us, all governments—and how we get a healthy working river and still sustain what is the vital part of our future, which is irrigated agriculture. Irrigated agriculture is the stability in our agricultural



sector and will continue to be the stability in the future. It is incredibly important to us as a nation. I can give you a couple of very simple statistics, which are not in the submission, to illustrate the challenges for us. If you look at the 1996-97 returns for water, you find that South Australia are making about \$1.4 million for every gigalitre, every 1,000 megalitres, of water; New South Wales on average are making about \$350,000 for every gigalitre—so about a quarter of what South Australia are making—and Victoria are making about \$500,000 per gigalitre. So the economic performance of each of the states comes out of its history, comes out of the intensification issues.

But we are turning water into wealth in very different ways in our basin. There are lots of opportunities to improve the economic performance of water. It is not about more water, because there is not any more in our basin; it is about how we use what we have much more effectively. You can envisage ways to easily double the economic performance of water over a reasonable period with reasonable support mechanisms. Governments supported the Pratt plan to look down the Murrumbidgee Valley to see what they could do there, and each of the other governments is investing in ways to look at how we support our communities through it.

At the moment the move towards environmental flows or the living Murray and a healthy, working river is seen as a huge threat to the irrigation industry. I am trying to explain to people that, in my judgment, it is the greatest opportunity this industry will have in the next 20 years, provided that governments do what they have done so far in the Snowy debate and establish a relationship with the community, which means that they will bring resources along to manage their intervention with that community in a structured and stable way. That is what they have said with the Snowy.

Our governments are now looking to us to work out cost-sharing arrangements between governments and communities. While they are certainly not using the word 'compensation', because that means different things in different governments in different states under different laws, they are saying, 'Let's work out what is the right adjustment mechanism to support communities that want to take that opportunity over time.' I would be happy to explore that area further with you because that is at the heart of the issue in the improvement of performance. I would have to say at the moment we have not established trust with the community; in fact, the opposite would be the truth. I will stop there. That is all I wanted to say.

**Mr SCHULTZ**—How do you overcome that problem? We are not just talking about flows in our major river system; we are also talking about catchments right through all of the towns affected by catchment water and into the river system. Even at this stage we all know how critical it is. How do you overcome the nervousness of governments at state and federal levels to make decisions that will be politically distasteful but certainly environmentally responsible, when already nervous Nellies are making comments about taking more water out of a system that has 27 per cent of the water flowing down the Murray River and the dams around this area, as an example, sitting at one to three per cent capacity? How do you overcome that?

**Dr Blackmore**—These are serious issues. Firstly, you have to understand the total water cycle that we are now running here, and that includes everything—and forests. In relation to where you live in your catchment, if you have more than 900 millimetres or 1,000 millimetres of rainfall and you convert 20,000 hectares of grazing land into forests, you would create a greater demand for water than the whole of Canberra. Should those trees have a water right? In South

Africa they do. That change would consume that amount of water, water that is being used by somebody else. In this system not one drop of water has left this basin since November 2001, and probably no water will leave this basin for another 15 months, in our judgment.

**Mr SCHULTZ**—Or longer.

**Dr Blackmore**—Or longer, unless there is a huge break. We are highly regulated. There is no wastage now in the classical sense; everybody is in this boat together. At the bottom end of the system at Lake Alexandrina people cannot pump because the salinity is 3,800 EC units. They have switched off the pumps to the huge wine grape developments because of that. If the weather stays dry, the lower lakes will go below sea level either later this year or early the year after. To get water to Adelaide we will have to put a new weir in the river to stop it going below sea level. We have no idea what will happen with salinity because we have never been in that situation.

The point I am making is it is a system issue. We have tackled the issue. There are 21 river basins within the Murray-Darling and each community sees itself as an island—the Murrumbidgee island or the Namoi island or whatever—but the reality is they are all connected. We have the unenviable task of somehow or other trying to bring together ways for communities to see other people's problems and come back to a reasonable point of equity. We are struggling with it. As soon as you raise the issue, you destabilise the debate. We have to try to get some stability back into the debate. We will need leadership from government to do that, quite frankly.

**Mr SCHULTZ**—The warning bells must be there for the community. Goulburn are on level 5 water restrictions. There is no sign of the restrictions being lifted because there is no water coming into the system, even with the rain we have now.

**Mr Goss**—One of the issues we are very conscious of is trying to get a knowledge base in front of the issue. With matters like this, it is really important to be able to make estimates of trends around the variability of the day. This particular matter that is so acute right now is not about a decision to be taken tomorrow to restore a big volume of water tomorrow; it is about getting in front of political leaders as well as the community at large what the long-term trend is that is masked by the variabilities from year to year and then running the discussion from there to a decision which results in a program which will take many years to complete.

This is a one-in-100-year drought. Dr Blackmore has said that the Murray flows on average at 27 per cent at the mouth. The flow has been at zero per cent at the mouth for the past two years. Any managed, sustainable river in the future will not be looking for water in an extreme drought year, because nature never did it either. So the real art in any long-term program is to make sure the river benefits from additional water in the wetter years but not in the drier years. So you need to see how variability masks what you are trying to do, restore the balance and get some sort of win-win out of this.

**CHAIR**—Before we go to further questions—

**Mr SCHULTZ**—Sorry, Madam Chair.

**CHAIR**—No, that is okay. That was a pressing question at the time.

**Mr SCHULTZ**—Obviously it is a very emotive issue.

**CHAIR**—I will ask the committee members to introduce themselves so that you get an idea of where our members come from.

**Mr SECKER**—I am the member for Barker. In my electorate is the Murray River from Swan Reach down, including the Murray mouth, which I visited again two weeks ago, I think. It is my guesstimation that the water level is about 40 feet lower at the Murray mouth than it was when I used to go fishing there 30 years ago.

**Mr FORREST**—I am the member for Mallee. About 900 kilometres of the Murray River are in my electorate. There has just been a redistribution and Lake Tutchewop is now in my electorate; so watch out!

**Dr Blackmore**—We won't go there tonight.

**Mr SCHULTZ**—I am the member for Hume. In my electorate I do not have as much of the Murrumbidgee River system that I used to have, but I certainly have an enormous number of catchment areas and, like my colleagues, I am concerned.

**CHAIR**—My electorate is in south-east Queensland. I am very concerned about the Murray-Darling Basin.

**Ms LEY**—My electorate is on the New South Wales Murray. Mr Secker and I have a lot in common, but probably not around the river. I think about 1,300 kilometres of the river are in my electorate, but you probably know that better than I do.

**Mr WINDSOR**—I am the member for New England, New South Wales.

**Mr SIDEBOTTOM**—I was just wondering what you had to do with the river, Mr Windsor. My electorate is on the north-west coast of Tasmania and has nothing to do with the river, but our party does.

**Dr Blackmore**—We in the basin have a very soft spot in our hearts for Tasmanians because, within our act, when we cannot solve our problems we can call on a Supreme Court judge of Tasmania to appoint an arbiter. So we might be calling on him shortly.

**Mr WINDSOR**—Following the line of questioning by Mr Schultz on how you create this trust arrangement, I think you hit on an important point when you were talking about the fact that you are dealing with a number of state governments and those governments have a range of different perceptions as to adjustment, compensation and property rights—all these sorts of issues. What do you believe a federal committee should be doing to display some leadership in overcoming problems in those areas? My personal view is that if you develop a strategy and inject some money a lot of the problems will go away. But, if we do not develop the strategy and do not inject money, we will have suspicion, the land-holders will always hold back and they will not trust anybody.

**Dr Blackmore**—That is a very important question. We have an independent panel that takes notes on what the community says, so people's opinions are not filtered through bureaucrats or others less emotional. Out of 49 meetings, of which most were public, we have found that the first question people ask is, 'Are you going to respect our current access rights and, if you are going to change them, are we going to be compensated or rewarded in some way for that change?' Not everyone talks about compensation. I want them to talk about investment because that is a far more strategic way to think about the issue. So that is the first issue out there, and you need to discuss it.

The question that goes to the heart of the matter is: what is the Commonwealth government's leadership role in this area? The Commonwealth has always led the states in relation to our basin. That is the reason the Commonwealth chairs our ministerial council and has two commissioners on natural resource issues where the Commonwealth does not have primary statutory roles. The basin has been of such major national interest. Seventy per cent of the water consumed in Australia is consumed in this basin. The nation has regarded the basin as an incredibly important national issue for almost the past 100 years.

What are the hooks now? What is important to you? I think you have a dual role now. We have run an economics reform agenda in this nation for the past 10 or 12 years where energy and transport issues have been in the driver's seat and the water issue has been an important part but came along a bit later with characteristics about sustainability and improved performance. We have seen a massive change, in fact a huge improvement, in performance across the whole of the industry—lowering the costs of agencies.

So what is the next generation of change? I think it will relate to what Mr Schultz has said: water is scarce, there will not be more of it and climate change, if it is occurring, will almost certainly drive us to a negative outcome and not to a positive outcome. Looking at the economic and leadership issues, we have to start up water trading across state boundaries in the Murrumbidgee, Goulburn and Murray, which can be connected physically—not all of it; you cannot take water from the Murrumbidgee and pump it up the Goulburn River, but you can transfer water to places downstream—to increase the choice for irrigators. Water trading enables folks to say, 'What do I want to do? Where do I want to go? Do I want to recapitalise my farm? Do I want to get out of farming? Do I want to realise some of that or do I want to increase the intensity of my operation because I do not have enough water to go into horticulture or I do not have enough water to go into rice?' or whatever the crop is.

What people have now were considered to be family blocks by governments when looking at soldier settlements or taking a closer settlement view after the wars, basically. We need to break that system because fundamentally it is not reasonable. Trade is working incredibly well in many of the valleys. In fact, in one of our systems, in the area that Ms Ley represents, 80 per cent of the water delivered this year was traded—a huge amount. So people trade as a matter of course, but the trading blocks are about one million or 1½ million megalitres in each block. If we opened those blocks up, we would have 8.6 million megalitres. That would offer a huge range of choice and there would be a huge economic dividend for the nation as people went about making money in a way they saw as reasonable. So that is one issue.

To do that in the southern basin we need to have a trader-friendly environment. There needs to be a sense of harmony about the access provisions in the states so we do not have distortions.

New South Wales have a 15-year licence, but with a 10-year review, and a set of rules on how that will be operated. Victoria have no such review provisions. In South Australia the minister can call a review at any time that suits him and make an adjustment without compensation. To give you an example, let's say I am a New South Wales irrigator and I have set up interstate trade. I am at year 9 in the New South Wales cycle and I say, 'Hang on, I do not know what New South Wales are going to do.' So I trade 100 per cent of my water to somebody in Victoria, into a holding company or whatever the hell I am going to do with it. I wait to see what New South Wales do: they will either increase or decrease the allocations. People are thinking the state will decrease the allocations and not increase them; I do not know. The state lower them. I wait until that dust settles and then I trade 100 per cent of my water back and I have kept it. I can set up an administrative barrier to deal with that, but it is not an effective trading block. So we have to sort that out.

We have the ability to set up other systems, like a transparent registry system that is mortgageable. At the moment how do bankers, for example, mortgage water? Water makes up 90 per cent of the assets on most farms now. But what bankers are mortgaging is the land, and the value of water is put over there. So the banks are worried about asset stripping—not that it is happening but they are worried about it. They want some stability in that as well. You want a mortgageable right, so you need a registry system. You would not set up three registry systems. Each state could set up their own, but you would have some sort of transparency across the systems where you could go in through a central system, pay a fee and find out where the water is and so on and so forth—the same as you do through lands titles. What is so difficult about that? With that access provision and by making the system much more transparent, we would bring the management of water into the modern world, basically.

**Mr FORREST**—Victoria already has a register for that.

**Dr Blackmore**—Yes, and so does New South Wales. But the registers have to be similar enough to record who owns the water, where it is, under what conditions it is held, what its reliability is—if you have 100 units, how often will you get that, as reliability changes—and any other conditions on its supply in terms of quality and other aspects. So there are four or five aspects that we should have. You would not want to shift the Victorian register. All you would want to do is make five or six fields the same. We have this system in relation to vegetation in Australia. We have the virtual herbarium. Everybody holds their records on plants, but you can go straight into the system and find out where a plant is in Australia. You can interrogate the system and get market information if you want to go into the market.

**Mr SCHULTZ**—Plants are in fixed positions; water flows.

**Dr Blackmore**—Yes, but your access right on your property is in a fixed position until you elect to sell it.

**Mr SCHULTZ**—I am talking about the ownership of water. How can you have ownership of water that flows north to south through half a dozen properties if it is not captured in a fixed area?

**Dr Blackmore**—We are capturing the access provision. We are not talking about the flow of water; we are talking about your access right to water. If you do not have one, you do not have

one. We are not looking at tracking every megalitre in a river; we are saying all your access rights are captured in a transparent way. We will also set up exchange rates. Low-security water in New South Wales is a different product from high-security water in Victoria. So you can exchange that just like exchanging dollars for pesos. It is an exchange rate issue, it is a mathematical thing, and we have the models to do that. We have a system that can run it, but we need some national leadership with the states to get that up.

**Mr WINDSOR**—How do we do that within the Constitution or do we have to go around the razzamatazz again?

**Dr Blackmore**—Yes, you will have to bring the states along because they will want to participate.

**Mr FORREST**—We have the Murray-Darling Basin Commission. So, if we have got that far, we can keep progressing.

**Dr Blackmore**—Our ministerial council recognise the four factors that are trader friendly, and we will now be advising COAG. Our ministerial council, comprising all the ministers, have said, ‘This is a very serious issue for us, but it requires leadership. We can do a certain amount as state ministers but, if we are to have equalisation across state boundaries, you will want heads of government doing that.’ So we will put that to COAG. If you think it is a serious issue, talk to the folks as you travel through the basin. A lot of our folks are nervous about trading. So I am not telling you trading is warmly supported.

**Mr SECKER**—What value would you put on, say, a gigalitre?

**Dr Blackmore**—We can give you the report on the latest trading numbers that we gave to the ministers. Permanent trade of a high-security product is somewhere over \$1,000 a megalitre. It is a bit more than that in some areas. A low-security product, a general-security product, in New South Wales is generally \$600 or a bit less.

**Mr SECKER**—A megalitre?

**Dr Blackmore**—A megalitre. But it is low security. People are pretty smart. If you have a look at the exchange rate, when you equalise, you will see it is about right.

**Mr SECKER**—What about on a lease basis, say, for a year?

**Dr Blackmore**—You go onto Water-Move. There is a water exchange operating in Victoria which operates to New South Wales as well.

**Mr SECKER**—Is it \$90 a meg?

**Dr Blackmore**—No, last year it went from \$320 through to \$500.

**Mr SECKER**—A meg?

**Dr Blackmore**—A meg, for an annual licence, because it was 40 per cent allocation on the Goulburn system, nine per cent on the New South Wales Murray and 129 per cent on the Victorian Murray. So the allocations were all different. The trading got to \$500 a megalitre—huge.

**Mr Goss**—It is fair to say that was an extreme price reflecting an incredibly dry year, and it spiked at that time of the year when farmers would have been desperate to finish their annual crops or to protect their perennial crops.

**Mr SECKER**—Yes, but I am trying to get a figure for normal circumstances, an average.

**Dr Blackmore**—\$30 to \$50.

**Mr SECKER**—\$30 to \$50 a megalitre?

**Dr Blackmore**—Yes, on the annual trade.

**Mr SECKER**—Fifteen hundred gigalitres of environmental flow is \$100 million worth of water, isn't it?

**Dr Blackmore**—No. If you go for a high-security product, it is—

**Mr SECKER**—If it is high security, it is a lot more than that. That is why I was trying to get an average figure—\$50 a meg.

**Dr Blackmore**—Yes, but you have to pay \$50 a megalitre every year. So, by the time you paid it every year and capitalised it, you would turn into a very significant bank. What I think will happen in any intervention is that if you are going to invest—following the Snowy paradigm—you will invest in savings first. Savings are generally more expensive than the market price, but they are probably an important investment in the future of Australia because you do not want systems that are grossly inefficient. To be frank, I do not know whether governments will do that.

Let us take the Darling Anabranh as an example. There is an area where about 50,000 megalitres go down the Darling Anabranh below Menindee and less than 5,000 megalitres are consumed. If you install plastic pipes, you have 45,000 megalitres. It will probably cost you about \$800 a megalitre for that secure water. Those projects are available, but they will not get us fully to 1,500 gigalitres. We can go into channel systems now. We have 12,000 kilometres of channel in the gravity systems plus all the private pumpers and whatever. We are not going to pipe 12,000 kilometres of channel. About \$100,000 per megalitre is saved piping the Mulwala Canal, the major channel, if you are doing it only to save water. About \$17,000 a megalitre is saved in the rice areas where a minor channel might supply two farmers. So we do not want to be poorer, basically.

**Mr SECKER**—Are we looking at cost benefit analysis? Obviously, from what you are saying, we are looking at cost benefit analysis. Is there a better way than having 1,500 gigalitre environmental flows every year?

**Dr Blackmore**—There are two questions there.

**Mr SECKER**—You are talking about over \$1 billion worth of water, aren't you?

**Dr Blackmore**—Yes, but over a decade it is hardly a major or frightening intervention for the nation, quite frankly. If it were \$100 million or \$150 million a year, it would hardly rate as a Commonwealth program, even if the Commonwealth funded half of it.

**Mr SCHULTZ**—Trading is only one part of the equation, isn't it? Where do you draw the line? Where do you put the cap on the amount of water that you use, given the fluctuating seasons that we have here? Part of the problem is the amount of water that is being used, the amount of water that is being lost through evaporation and wastage, and the archaic methods of using water for irrigation or whatever. Where do we put a cap on the amount of water that we can use for agriculture and, at the same time, how do we keep an environmental flow going that keeps our river system and, more importantly, the ecosystem alive?

**Dr Blackmore**—We have a cap on every valley, and that cap is now legislated. Every valley is capped at the 1993-94 level of development, except the Queensland ones. They are independently audited every year, and that audit information is available publicly. There is a different trigger amount in each valley. Under the audit provisions in our act, if a state are in breach of their cap in a valley, they exceed that trigger amount, the state minister has to explain to the other ministers how he will bring that valley back into balance. At the moment we have two valleys, both in New South Wales, that are in breach of the cap. At the next council meeting the New South Wales minister will explain the methods to bring those valleys back into balance. One valley is not very far from here.

**Mr SECKER**—Do Queensland have their caps yet?

**Dr Blackmore**—No, Queensland have not, but they have their plans out.

**Mr SCHULTZ**—Are they recent breaches or breaches that have been in the system for two or three years?

**Dr Blackmore**—The Lachlan is a recent one. The Gwydir has been in the system for two years.

**Mr SECKER**—Getting back to this issue of water funding, if everybody had to pay \$50 or \$100 a megalitre for water, not including infrastructure costs, you are basically saying that we will not be growing rice or cotton in Australia, and we probably will not have irrigated pasture for dairying.

**Dr Blackmore**—Let me unravel that question a little, because it is a very important question. What we are doing for government is looking at all of the water recovery options—from entering the market, to investment in infrastructure, to providing opportunities for better on-farm infrastructure, centre points, better layouts, whatever. A suite of technologies is available to us. Some people want new technologies. Let us have a look at what has happened in our world, your world, in the past decade. We have had a huge increase in microirrigation and in the development of horticulture up and down the valley—go out from here to Jugiong. The



technologies are highly efficient and effective. One hundred per cent of the efficiency dividend that came out of those technologies went back to production—100 per cent of it. In South Australia in the past decade 10,000 hectares of new development have been totally resourced from people trading from the gazetted irrigation districts as a result of the water freed up by that new development. That is a good thing. I am not saying it is a bad thing at all. There will be another 20 per cent improvement in irrigation efficiency over this decade. There is nothing coming out of R&D and other agendas to stop that from happening.

The issue is whether some of that efficiency dividend should go back into sustaining our rivers. That is the argument we are having. How do we invest? Which is the smartest investment? Do we use a simple market mechanism, or is there an intervention that people think is more cost effective to the nation and will still respect people's access right? That is the debate governments are having at the moment. I cannot tell you what the answer is. We have been working on the issue for two years and we obviously have some pretty strong views about what is effective, but we have not got governments past the post and we are a hell of a long way from having communities anywhere close to the starting post.

**Mr SECKER**—I know you probably do not want to answer this question, and I do not blame you, but if you are getting a return of \$16 per megalitre for rice growing and \$30 per megalitre for cotton growing, and it costs you \$50 a megalitre for that water, plus your infrastructure costs, you will not continue growing it, will you?

**Dr Blackmore**—I do not know where the numbers came from, but if your infrastructure costs are sunk and you are paying just an annual fee for operation and maintenance you have a very effective industry. I am not defending the rice industry, the cotton industry or any other industry. One of the big traps in the water debate is to pick winners—

**Mr SECKER**—Or losers.

**Dr Blackmore**—Yes. We are saying, 'How do you maximise opportunity? How do you let people follow their own choice? How do you recognise that we are sitting in an area where we have very significant biophysical change with salinity occurring?' We do not make dumb investments for the nation when we know an area will be salinised in the next 20 years. A lot of that information is available through the land and water management plans the folks have put in. There are a lot of areas where we, governments—you, governments—will not allow access to drainage. Those decisions were made in the 1980s because otherwise South Australia would be out of business. Mr Forrest, does your electorate extend as far as Kerang?

**Mr FORREST**—Yes.

**Dr Blackmore**—If we allowed subsurface drainage into Kerang, for example—there is surface drainage now, and subsurface drainage would mean those people could farm salt-free—that would double the salt load in the River Murray from 60,000 hectares. Just in that one region, 60,000 hectares of subsurface drainage disposed of into the Murray would double the total salt load. So governments said, 'No, we will not be providing access to that.' We run the largest system of tradable pollution entitlements on earth. That is why we still have a river operating in South Australia.

**Mr SECKER**—As you said, we have problems in Lake Alexandrina. I am sorry if I am dominating proceedings.

**CHAIR**—Ms Ley is champing at the bit.

**Mr SECKER**—Okay. It is an important issue and I do not think we should have a time limit on it. I am prepared to stay around.

**CHAIR**—Yes, so am I, so do not worry.

**Mr SECKER**—Do those pontoons in the middle of the river measure river flow or salt?

**Dr Blackmore**—They are continuous salinity meters.

**Mr SECKER**—The ones I have seen in South Australia were put there only fairly recently.

**Dr Blackmore**—There have been some for 10 years, but progressively—

**Mr SECKER**—At Morgan the salt level has been going down for five years, but has it gone up again this year as a result of—

**Dr Blackmore**—No, this year.

**Mr SECKER**—Is it still going down?

**Dr Blackmore**—In the river down to Morgan the salinities everywhere have been lower than people would have experienced in living memory. There is almost no irrigator who is alive who would have seen salinities or turbidities at this level.

**Mr SCHULTZ**—Is that because practices have improved?

**Dr Blackmore**—No, there is simply no drainage water. The ground water level is down because of the drought. All the water comes out of the Snowy and/or Dartmouth, which is pretty flash water.

**Mr FORREST**—You can see the bottom of the river at Boundary Bend.

**Mr SECKER**—What about lower down the river? You are saying it is pretty bad in the lake, but what about, say, at Mannum?

**Dr Blackmore**—Mannum has been good, but once you go below Mannum and into the lake you find there are concentrations. No water has been leaving, even though at every meeting I have in New South Wales the first question irrigators ask is, ‘You have a major problem down there. Why don’t you remove the lake, the barrages, and let it go back to being an estuary?’ Then 600,000 megalitres would evaporate a year, it would be grossly inefficient and so on and so forth. There is an answer to all of that which I will not bore you with, but what happens in the

lower lakes is the evaporation of a net 200,000 megalitres of water a year leaves salt behind if there is nothing going to the sea. It will go like that, and that is exactly what is happening.

**Mr Goss**—It is about 1,300 EC now—

**Dr Blackmore**—On average.

**Mr Goss**—Increasing to about 2,300 when you get to—

**Mr SECKER**—Of course it is affecting the Coorong as well, and that is one of the reasons there is a call for the big flow to come down, which cannot be achieved when there is no water there. Is the Murray-Darling Basin Commission also involved with the Coorong?

**Dr Blackmore**—Yes. Up until 1991 there used to be barrages at the end of the Murray. All governments said that was probably not reasonable and they agreed to change the agreement. They made the mouth of the Murray the end of the Murray, which was probably pretty sensible.

**Mr SECKER**—You are not concerned with the Coorong then, are you?

**Dr Blackmore**—No, but we are paying 100 per cent of the cost of the pumping of the sand to protect the Coorong.

**Mr SECKER**—Yes, I know that. The state government took the credit for it, but that is all right. What about the idea of getting the seawater even from tidal acts and from lower down the Coorong? Is that part of your—

**Dr Blackmore**—We may have an answer for you in the next couple of years. The energy profile for the Southern Ocean is huge when it hits that area compared to most other systems we deal with—estuary systems. There is a lateral flow of sand moving around towards Adelaide—or Victor Harbor. The energy from the sea is overpowering any energy coming out of the lake, so it is pushing sand in. We are going to have a look at a sand-pumping operation in Queensland where there is the same problem on the Tweed River. I am not sure whether we will pick up that technology. We are doing all the geomorphology at the mouth now—hundreds of thousands of dollars worth of investigations—because no-one knows whether we can stabilise the problem in this energy environment. We have not done this in this nation in an environment with this amount of energy. We can do it for the Tweed River and so on, but this area here is dominated by the Southern Ocean. The amount of water we have to put in on average is over 2,000 megalitres a day. Think how much infrastructure would be required to pump 2,000 megalitres a day. It would be pretty significant.

**Mr SECKER**—Yes.

**Dr Blackmore**—That is where the debate is now.

**Mr SECKER**—Except for the Coorong, which is lower than sea level—you can use gravity to get water from the sea.

**Dr Blackmore**—For part of it.

**Mr SECKER**—Yes, for part of it, down at the lower reaches.

**Mr SCHULTZ**—Is there any good news? The salinity is obviously decreasing. Is there any good news for the ecosystem? Are the fish returning? Is the growth on the banks adjacent to the rivers stabilising?

**Dr Blackmore**—All of the investment the Commonwealth has made through the states in land care, our land and water management planning and all the rest has been fantastic. It is rated as world's best practice. I would bring people in to look at it. That sort of community engagement has been a fantastic thing in stabilising those areas. So we have done a hell of a lot as a community, and we should celebrate it. So there has been fantastic, good news.

**Mr FORREST**—I am pleased to hear you say that because Professor Cullen told us that those programs were undermining the Murray-Darling Basin.

**Dr Blackmore**—I do not know what Peter said. If you live in the upper part of the catchment—say, on the Murray or even the Murrumbidgee down to where the major offtakes are—you have every right to think you have a river in pretty good condition. Some of the underlying issues are difficult to register. The fish population levels are dramatically below their natural population levels—generally less than about 10 per cent over all the basin, which is dominated now by carp. That does not mean people are not catching lots of fish. My colleagues and friends at the Wakool system are catching good fish. Why is that so?

**Mr SCHULTZ**—Mainly carp, though.

**Mr FORREST**—No, the cod are back.

**Dr Blackmore**—Do you know why the cod are back? We had a little event at Hume in 1996 where we had to release twice the volume of Sydney Harbour—a million megalitres on top of a flood—and extended the duration of a flood. We had a safety issue at Hume. It appears that the fish you are now catching are of that age profile. We created a 23-day artificial tail on a natural flood, and that was long enough for the fish to finish a breeding cycle. People are now seeing the results of that, and those cod will live for many years. So I think we have to be a bit careful about what sorts of conclusions we draw from the evidence. The science tells us—and I do not want to go into the politics—that we are not at the bottom of the J-curve yet. So what you see now in terms of river health is not the bottom of the J-curve.

I have a report on my desk on concerns raised by community members in South Australia, New South Wales and Victoria that huge areas of red gums that have been healthy are starting to defoliate. They asked, 'Why is this so?' So we put together a team of scientists and sent them out there. They have done the first bit of work on the problem and it looks as though probably 200- to 300-year-old red gums are unrecoverable.

**Mr FORREST**—Whereabouts is this?

**Dr Blackmore**—In your area, start at about Kingston, go through Chowilla and through the back of Lindsay Island. It is happening on the first and second tiers of the flood plain. In some places it is okay because there has been a flood. We think the reason this is happening is that

these trees used to get a flood once every 3.3 years under natural conditions. They now get a flood about once every 11 years under the current regime. The longest period between floods under natural conditions was about 11 years. The longest period now is 24 years. These trees have seen many droughts, so these trees have been through sequences like this before. So it is the fact that they probably have not had a flood that is the trigger. We cannot do anything about that now. There is a tourism industry there, which you are probably aware of, with 1,500 houseboats. In economic terms in the basin it is a bigger industry than rice, cotton or dairy as individual industries. Those folks are entitled to have a river that provides some amenity.

**Mr SECKER**—You cannot get much past Renmark now. You used to be able to go right up to Wentworth and the Darling River.

**Ms LEY**—Mr Schultz asked whether there was any good news. The problem is that in the debate we have not set the benchmark for what sort of river we want. People have different ideas. My constituents will say, ‘I am catching lots of fish, there are quite a few trees along the bank and the river is better than I have ever seen it.’ There are various anecdotal stories like that, but nobody in this debate has said, ‘This is the classification of this river. This is the sort of river that we want to benchmark, that we have to have and that we have to aim for.’ Don’t you think we ought to have done that? Don’t you think we should be doing that?

**Dr Blackmore**—That is a great question. We are doing that. We have not gone out and exposed it. The council wants evidence. Your community wants evidence. You have been in enough meetings with me where it has been said, ‘We do not believe the science; we want evidence.’ This nation has a very thin knowledge base of ecology. We have invested most of our money in commodity research, because that is what was driving us economically, and we still do that. It dominates grains, meat and so on. That is important. I am not saying it is not important. But over here the Commonwealth, for example, has 13 R&D corporations. Twelve of them are commodity focused and one of them is on landscapes, Land and Water Australia—the only one that invests solely in how landscapes behave and the ecology you are after. So we are starting a long way back in having universities and institutions with people who think this way and try to understand it. It is not an excuse; I am just trying to put that on the table because that is the absolute reality.

For the past decade we have been investing many millions to try to understand what we were trading off so we can get to your objectives, so you know what the trading system is. A Murray flow assessment tool is being developed to help us understand those issues. It will look at fish and fish production. So, if we change the flow from here to here and reconnect the flood plains like this, the best evidence we have shows that fish will do this; and, if there is a change in flow from 350 gegalitres to 750 or 1,500 gegalitres, this is what you will get—this is what you get with wetlands connected and, hence, bird production; this is what you get with algal suppression; and this is what you get with habitat condition on the flood plain trees.

There are 60 scientists working on 10 reaches of the river and on the Murrumbidgee and the Goulburn systems. So in the next 10 weeks you will be overwhelmed with information. Before I came here I went through the evidence base for it: how we go through and take that evidence and then run the community debate about what is environmental equity—that is what you are arguing; I am just using different words—and what is a healthy, working river for us. New South Wales have decided a healthy, working river for them is having 37 per cent of the original

flow—they have taken some water from the Murrumbidgee folk and put it through a very exhaustive process—at the end of the Murrumbidgee. So that is equity in the Murrumbidgee Valley. We are arguing that in the Murray Valley we have 27 per cent left at the end of the system. What is equity?

**Ms LEY**—Twenty-seven per cent of what?

**Dr Blackmore**—The median flow; the original flow.

**Ms LEY**—Is that pre dams?

**Dr Blackmore**—Yes, pre the natural—

**Ms LEY**—Of the Snowy system?

**Dr Blackmore**—Yes, pre everything.

**Ms LEY**—That leads into this question: if you are going to use measurements that relate to pre the Snowy system, we are saying that the river as it was then has a stake in how the river is today, and if it is so fundamentally altered by the dams we have put on it is that a reasonable exercise?

**Mr Goss**—I want to pick up on a detail in the discussion about the Murray flow assessment tool, and that is it does not do that. A very deliberate decision was taken to benchmark it at the cap and to benchmark it today. So we run it off both. I think it deals with your question of whether there is any good news. We have been very careful not to use natural conditions as some sort of goal or benchmark. It is accepted in all that we do that what is past is past and that we start from today or somewhere where we have the benchmarks, such as the cap on diversions of 1995. Then you estimate: if you took these actions, this is what you would expect to see. So the Murray flow assessment tool, which Mr Blackmore has described, answers that question.

**Ms LEY**—But how are we going to answer the question? For example, you talk about some stretches of red gums dying. Suppose those red gums are not sustainable under a condition of access that we can achieve but we have, for example, red gums in the Barmah-Millewa forest. I am not saying this is the commission's view, but how should we answer the question of whether we sustain those dying trees or we say, 'Okay, we have good examples of this type of vegetation; we will have to abandon these and keep these as examples'?

**Dr Blackmore**—I think that is the very question we are dealing with.

**Ms LEY**—That this assessment tool can answer?

**Dr Blackmore**—It will give you the evidence base to have that discussion. I will use another example. Our communities are reasonably mature. In 1920 they had a debate about trade-offs and equity. New South Wales and Victoria wanted to use more water. The trade-off was they would give South Australia access to transport. So they built the weirs and locks. New South Wales and Victoria, with the Commonwealth, funded them so they could allow their customers, consumers, to take water for the next however many years. We have made those choices many

times in the past. We have done it from a slightly different knowledge base and with different value systems and so on.

We have to get this objective information, not value laden, into the community so they can start debating what is a fair thing, what is the balance. For example, if we know the current system will trade off 80 per cent of the vegetation downstream of Mildura over the next 30 years—I am not saying it will; I am just saying if that were an outcome, because we are nowhere near stability, we know we have not reached stability yet—the issue is what we do about that. Are there mitigating strategies? Are there things we can do—raise the weirs so we can flood with less water and so on and so forth? We are looking at all of those issues. So we will run that sort of debate.

We made a decision in the 1970s not to abandon the lower Murray. I think this was a defining decision for the nation. They said, ‘We are not going to pipe Adelaide from the Murrumbidgee junction. We are not going to pipe all of the irrigation areas in South Australia from Mildura and use the bottom of the river as a drain.’ That was a conscious decision. The economics were done. It was looked at. It was called the Pells scheme. They made that decision. So we have to revisit issues. What are the value systems we want to maintain? Will South Australia be happy with a dredge in the river mouth for the next 50 years? We know that under current conditions the mouth will likely close three out of 10. Historically, it has closed once in the past 200 years. So there has been a change. We can fix it with engineering. Is that trade-off a reasonable outcome? We hope that sort of debate will inform people over the next six months.

**Ms LEY**—The other important point is that, when those 60 scientists come up with their results that, for example, 80 per cent of the vegetation in the lower Murray will die in the next 30 years, people have to be able to look at that information and believe that no value judgments have gone into that exercise that has produced that result.

**Dr Blackmore**—Yes. Professor Gary Jones, the CEO of the Cooperative Research Centre for Freshwater Ecology, has a very strict rule that the science community cannot be advocates for the environment; they have to be advocates for objective science. They have an evidence trail for every bit of evidence, and you can follow it. So if at the end of the day we are not satisfied we can say, ‘Hang on, we are making a key decision on material which is speculation. So we will invest in fixing that up because we cannot go forward with that piece of information; it is such a key issue for us.’ I will not give you any examples now, but a few of those will come out. How much of the evidence base is now included in it, Kevin?

**Mr Goss**—We think about 90 per cent of what is published in recognised journals. We have captured that. I would like to emphasise a couple of things because there is this concern about value judgments being in these approaches. If we are going to build these decision tools which really support the decisions made that are values based and are not done by themselves, we have to make some assumptions about what we put in them. So we do not start with a blank sheet. In this particular assessment tool, probably more than 100 wetlands are marked down on eight reaches of the river Murray. So we took into account the Ramsar Convention on Wetlands on the basis that by some process these wetlands were given the status of being internationally important. So we put those wetlands into the assessment tool. Then we took into account the wetlands of national importance and the wetlands of state importance. So we do take into account some prior judgments about what should be considered.

When the Murray-Darling Basin Ministerial Council first came to grips with how you would measure and build confidence in any sort of response, they identified what they called icon sites, which were very high-profile areas that you would try to address and then deal with the balance issues between them. The icon sites are the Murray mouth, the Chowilla flood plain, the Gunbower-Perricoota forests and the Barmah-Millewa forests. So some judgments are made about how you measure the impacts of these things, but we do it on the basis that those judgments have been made through credible processes. I think that is important. It is not as though it is just mush all in there; it has been fairly carefully selected.

Then, as I said earlier, this evidence based trail is just to make sure that not only what has been published is captured but also it is actually categorised according to levels of confidence you can have in it. So something supported by an article in a referred journal that has stood up to international scrutiny is given higher weighting than something that is a consensus of some experts, for instance. At the end of the day, its power is not in the answer it spits out. The power is in going back into it and applying sufficient scrutiny that all the assumptions and all the evidence pass certain tests and therefore there is a confidence in the options it is throwing up. That is a new development in any of these sorts of approaches.

**Mr WINDSOR**—It still involves a political cycle.

**Mr Goss**—Yes.

**Mr WINDSOR**—We spoke to the CSIRO, who told us about models they have for telling us what will happen in 200 years, such as Perth will get hotter and other such things will happen. If you punch in certain statistics at the start, they can give you different outcomes in terms of future modelling. One question we asked them was, ‘Can you model backwards? Tell us whether 20,000 hectares of trees have an impact on the system. Tell us what it looked like when there were no dams, no farming, plains and grass areas, and a lot of trees.’ They just looked around the room and blinked at each other. It is all very well to say that we are starting with the cap now and we will get positive progressions off the back of the cap, but to bring people into the equation we have to be modelling on something that was near natural. As far as the commission is concerned, what would have been happening in the system had there been no dams and no agriculture at all?

**Dr Blackmore**—We can tell you that in terms of the hydrology because a lot of very good records have been kept since 1892. There was agriculture before 1892, but we have a records base that goes back that modelled the natural conditions. So we can give you the natural hydrology for every river, basically—so what would have happened without dams. Where it falls over a bit is there has been a change, particularly in the high rainfall zones up around here. When it goes from an open pasture, a lightly treed area into a forest area, there is a change. But those areas are relatively modest when you have a look at it. In fact, what has happened is there is more water in our rivers generally now. The Keiwa River has had about an eight per cent increase—and I have to point out that this figure has no validity as a generality because it is based on one river—in flow as a result of clearing; so more water to ground water, more base flow, more run-off and so on. It is about eight per cent. That is not the start and finish of the world but is an important contribution. All that water has been allocated to consumptive use. It has all been allocated within the water rights that people currently hold. So it is a challenge, but you are the political engine.



**Mr WINDSOR**—It gets back to what Ms Ley was talking about earlier: the political process has to market something to the community to say this is of benefit. The community will come back and say, ‘You have had 60 scientists out there doing this.’ They are working on a base which is predefined by state, national, international et cetera. The community will say, ‘What was it really like anyway? I can remember my grandfather saying he could walk up the Darling five years out of 10,’ and all these sorts of issues.

**Mr Goss**—We do model backwards in this particular instance, which is part of the power of it. We have over 100 years of records on the Murray reflecting development through that time. If you change the question to whether we should have 350 gigalitres back in the river and you put that back into this, it will show you what the signal would have been over the past 100 years if that had been the case for those 100 years. It does not take somebody back to 1957 to compare that. But what it says is this about variability—‘If we had our time again, this is an expression of variability on the basis of 100 years.’ In that sense it does take you back and give you some sort of grounding in what might have been. I think that ought to settle some of the questions that come up. As I said at the very beginning of giving evidence today, variability is the most difficult thing to look through. In this case we use 100 years to show it. In the case of salinity, to try to get these fluctuations out, we do everything off a 25-year record to set the benchmark and then we move forward from that.

**Dr Blackmore**—I challenge the issue because I think in relation to the services we get out of the basin you cannot go back to natural conditions and our ministers will not go back to—

**Mr WINDSOR**—I am not suggesting that, but it is in the politics of how you sell the thing.

**Dr Blackmore**—This year the river would have stopped flowing at Albury. It would have stopped. I think in the three months November through February the inflow was 15 per cent lower than the lowest ever inflow in the past 100 years. So the river would have stopped. That is not a service any of us want. We do not want to go back to natural conditions. The salinity change is so profound now. The current ‘business as usual’ approach within the basin will mean an area equivalent to the total Murrumbidgee Valley will have high watertables in 50 years. In my judgment, that will be unstoppable unless we change some of the things. Where there is salt attached to that watertable change we have ourselves a problem, and we are starting to see it—Murrumbidgee salinity is going up every year and so on. There are now in your area lots of small streams that are no longer usable. The main streams still are, but a lot of the peripheral streams are not. We have serious problems. It is a waste of time, in my judgment, even having a conversation about natural conditions. The argument is what is the benchmark in terms of environmental equity, what set of environmental services does our nation need, what is reasonable and how do we get to that? How you structure that debate is where we are all struggling, because to go back to natural conditions is not within our gift as a nation. Somebody else has stolen our clouds. The Northern Hemisphere largely will increase our variability of rainfall, thank you very much, and we will have to live with that.

**Mr FORREST**—I do not believe that.

**Ms LEY**—Touchy subject, clouds.

**Dr Blackmore**—I will not argue about it, but let us assume, whether we accept it or not, change is occurring.

**Mr FORREST**—You do not even know. The nation is not investing in understanding the issue, so you cannot say we cannot get the clouds back. We are not investing a red cent. All the other countries are—China is spending 100 million.

**Dr Blackmore**—One hundred and forty-nine countries cloud seed, so not everyone is a dill. Most people do it.

**Mr SECKER**—We cloud seed.

**Mr FORREST**—Only in Tasmania.

**Dr Blackmore**—Not only in Tasmania; we do it on the mainland.

**Mr FORREST**—No, we don't.

**Mr WINDSOR**—Of the various options that you talked about earlier, given that there will be this latent distrust of the science about what was natural and what we are trying to recreate—and it really is irrelevant, I would agree with you there, but it will be fairly important in the way the process is marketed—there will always be a bit of an argument in the middle. Do you see a role for the national government or the states and the national government together in actually entering the water market, which is trading effectively, and removing some water from other uses and restoring it into the system so that the communities, the owners of the water or the licence holders are not disadvantaged financially? Do you see that as being the most effective way of doing this—'Let's produce the dollars, let's decide what the agenda is, and if it is 2,000 gigs let's develop that up to whatever the numbers come out at'?

**Dr Blackmore**—The government has made no decision on an answer, so the options are these. You invest in infrastructure—so you make a choice on what is of net benefit. This is whether it is in pipelines, in flush channel technology. Australian products are now leading the world in relation to channel technologies—and, quite frankly, we will need to put those in to modernise our channels. That will deliver a significant water dividend back that does not affect farmers significantly. In fact, they get a huge improvement in service. They are already investing in this technology, but it is a tiny end of the agenda. Most of these areas cannot afford more than a few hundred thousand dollars or a million a year, and this is \$300 million. That would modernise our systems, set them apart as world's best practice and get most of our gravity irrigation systems operating at about 85 per cent efficiency, accurate measurement, two- to three-hour watering, so you can order water within two to three hours. It has cracked all the problems we have had. It is solar energy driven. It is pretty flash stuff. Those sorts of technologies should sit there. These things that we should roll out define us.

A whole lot of farmers who want on-farm infrastructure already have debt profiles which make it very difficult to do it. For example, for some soils in some areas farmers will want centre points, centre point irrigators. Having a centre point irrigator that takes the pipe and puts it into the channel means he will not have to fill his farm channels when he irrigates every 10 days. The saving in that alone is two megalitres per hectare. Provided you can come up with a reasonable

public-private partnership using a market mechanism—no compunction; put it out there as an option—that irrigator can go in without affecting a farmer's debt profile over a reasonable time. Not everybody can do this; not everybody wants to do it. But you can come up with packages that provide opportunity for people to do these things.

Then you have to say whether you are going to stand in the market. Standing in the market as a buyer is certainly very important, and I think that is the issue you raised and asked questions about earlier. I will give you a couple of numbers to give you some idea of the scale. On average, the annual trading market in the southern basin is running at about 800,000 megalitres—a lot of water, twice the volume of Sydney Harbour. It has been a very effective market, and I think it has been done quite well. The permanent trade, though, of megalitres from one individual to another has been running at less than 80,000 megalitres. If you are going to come into the market—and we are talking about numbers such as 500,000, a million or whatever—no matter how careful you are, it is hard to see how you could not distort the market for the existing customers who want to readjust their operations.

We have a whole heap of people now trying to develop what would be a smart market mechanism that will not distort it so that people who want to readjust their horticulture, their rice or their dairy are not suddenly priced out. I call it the Los Angeles syndrome. The water market in California—I forget the numbers now: I think it is \$23,000 a megalitre or \$23,000 an acre feed—is absolutely distorted by industry and urban. Farmers are all wealthier, but if I want to readjust by buying more water I am not in the game. I just cannot compete with that sort of investment. So our challenge, your challenge and I think everybody's challenge is: if you want to provide an adjustment mechanism, whatever scale governments agree that intervention should be, if it is anything, and if you want to respect people's access right, stumbling into the market is likely to be a quite difficult thing to do if you are going to go in on any scale.

**Mr WINDSOR**—You are better off using the same amount of money and come through a property right regime and take some off the top. That way, you do not inflate the—

**Dr Blackmore**—I think there are ways to do it that are less distortionary, but it all depends on scale and it depends on whether you can recover 300 or 400 gegalitres from bricks and mortar investments, just opportunity investments, which are important for the nation as well. It is scale. If you had to find 100,000 megalitres by entering the market, there would not be a blink.

**Mr FORREST**—I think we have some good information on the record and most of the questions have been asked, but I want to take a bit further the issue Alby Schultz started with, which is probably the issue we would like to end on. I hear you saying you are looking for leadership. It was not much fun standing in front of the First Mildura Irrigation Trust meeting last Wednesday night and trying to explain what the 'Big Murray' is all about. It seems to me we will not build community trust unless we settle the property rights issue so that people understand much more clearly what they have a right to. There is this issue of sales water, which they have been using for the overdraft and which they felt was theirs, and it is not. These things need to be settled. If you want us to help provide some leadership, we need to get that thing settled quickly and do some real work on a uniform basis right across the states on defining what property right is in terms of water—underground and river access, all of it.

**Dr Blackmore**—You will not get any argument from me.

**Mr FORREST**—What can you do to progress that? We have been a bit disappointed in what we keep hearing.

**Dr Blackmore**—On the record or off the record?

**CHAIR**—You can do it on the record; we do not mind.

**Dr Blackmore**—I might! We are into an extraordinarily career-limiting area. This is a very emotional and important issue, and I do not want to in any way make it glib. You have to balance two things. I will start with a few truisms. I do not think I see in any states anyone not vesting water in the Crown. So all water in Australia is vested in the Crown, and they are not going to change that. Quite frankly, every time you see Alfred Deakin's statue you should bend over and kiss his feet. He did the best thing he could have possibly done for this nation in doing that. If we had the prior rights system and repeated the mistakes of the states and other places, we would have systems that are so moribund we could not adjust and we would be the poorer for it. So you do not want to go down that path.

I think you need to balance the two competing demands. Irrigators want investor certainty with a sufficient time frame to run a stable relationship with their bank manager and their family. They want to know the rules at the end of a period under which an assessment will be made of what their access right is. Whether it is to do with a change in climate, a share of the resource or community values, they want to know about the public and private relationship with that change—that is, how much of that water will come off, because there has been climate change without compensation or without adjustment, and when do we hit a level where a relationship with government and the general community is appropriate? Is it five per cent, seven per cent and 10 per cent? We need to agree on a prescription that contains those characteristics. Let us say the access right was for 15 years and you capped the change. I am not saying governments are going to compensate, but if we find we have a serious adjustment to make because of changing community values: 'We will run a stable relationship with you but if that becomes more than'—if I say a number it will be abused—'let's say seven per cent we will start talking to you about what that means in adjustment for you, for your community and so on.'

What happens is people then know they have—whatever that is—97 per cent of their current water right stable for 30 years. Is that reasonable? Is that enough? What is sufficient for investor certainty in a world in which, quite frankly, there will be shifts? We have a reasonable amount of evidence that there are going to be shifts. You cannot just deal with property rights as a glib issue. I am not saying that you were or were not thinking along these lines, but the issue is trying to crack that: what is sufficient for those people having access to, in my world, 80 per cent of our natural resource base, which is important. But at the end of the day you have to adjust it in some way—'There is a private responsibility for that for me because I had access to something that was part of the family of resources we have as a community, but on the other side of it I am also capitalising on my own investment, I am producing the food and fibre that keep the country ticking along, so I want to know that at the end of the day if things get a bit rocky I will not be left hanging out to dry.' That is the relationship we have not been able to establish and, quite frankly, the reason that New South Wales irrigators are very concerned—and I see it across the whole state—is that they do not know where the reform agenda will stop.

**Mr WINDSOR**—Part of the problem, and it has emanated from government—and you spoke about it earlier, where water started a little behind transport and energy—is that at those very early meetings this issue of property rights Mr Forrest speaks about was factored in. It meant different things to different people, but they took on board that, if there were to be changes for the greater good, there would be some sort of acceptance of what we were doing. That has flowed through to the national action plan. The Snowy legislation went through the parliament today. It has flowed through into these catchment blueprints, these regional blueprints, that are supposed to recognise property rights. I do not disagree with what you are saying, but governments of both persuasions have been saying that at some stage property rights will be defined and that in certain cases, even with the national action plan where there are clawbacks in allocations, there will be some form of compensation. It is not the farmers out there saying this; they are government words.

**Dr Blackmore**—Absolutely.

**Mr WINDSOR**—Going back to our people and saying, ‘Just trust us on this,’ and to develop trust is very difficult when it has been nine years and we still have not recognised it.

**Mr FORREST**—You are avoiding the word ‘compensation’. You avoid using it.

**Dr Blackmore**—I will be frank about this: I cannot use it, and I cannot use it because I work for six governments which all have legislation with the word ‘compensation’ in them. The way it is written into the various water acts, transport acts and others it has a particular meaning. If I start using that word glibly around here, it will be picked up on. All I can do is respect what my governments have been saying. Take the Snowy debate at the moment. Governments and two premiers have said they are not going to affect the irrigation industry; they will go in and invest, whether it is through market mechanisms or somehow, to obtain the water they need. So I am working on the principle that for any intervention on the Murray they will do that. On your property rights issue, New South Wales have in their legislation compensation, as do Queensland, for 10-year periods. So 10 years stability; review; set of rules; if we touch it in the 10 years it will be compensated. No-one has tested it. No-one quite knows what it means. So it is quite a stable arrangement. In fact, it is the most stable arrangement in the basin right now.

**Mr WINDSOR**—Yes, but not accepted by the—

**Dr Blackmore**—Absolutely. But it is far more stable than, say, our South Australian arrangement where—and this is where the water trades to, I have to say—you have an annual licence that is being rolled over in perpetuity. Every year it gets rolled over, so it seems very stable. But there is a provision in the act where the minister can come in and review it, because the environmental issues in South Australia are such, and adjust the water without compensation. I think there would be a riot, but that is what they can do. The water that is trading permanently at the moment is trading out of New South Wales into South Australia.

**Mr WINDSOR**—But you have had Commonwealth leadership saying for eight years that there will be a definition of this so-called property right.

**Dr Blackmore**—Yes, and I think that is one of the things that have to be cleared up. From that side of the table, you have Peter Cullen going around saying that it is fundamental, and Peter is

saying it is fundamental for the same reason I am saying it is fundamental. It is fundamental so that people know what their rights are—and I am not using property rights, I am using stable access rights, because property rights has its own meaning. Once people know what they have got, you also know what is left, which is fundamentally important as well.

**Mr Goss**—The questions are coming back to the role of the Commonwealth, leadership and money. There is a track record, which I think is worth reflecting on a bit when it comes to long-term protection of water resources, particularly in the basin. The way it has unfolded, particularly in salinity management, and it could apply here, is that the Commonwealth's investment—it has been investment in cost sharing—has tended to deal with the equity issues across the states. Nature, history or whatever means these things fall in different ways in different states. In the case of salinity, each state set out a take-care-of-its-own approach—that is, to allow more salt to get into the river to relieve the pressure in irrigation districts while investing in salt interception schemes to compensate for that. Each state took upon itself through a credits and debits scheme to take care of its own. Meanwhile, the river had to be improved, from 1989 until now. So the Commonwealth's share of that bought the outcome for the river—each state looked after itself, but that was not good enough, particularly for South Australia—and it was agreed as a reasonable proposition that the three states and the Commonwealth would each put 25 per cent into that investment. It worked out roughly right over about 13 years.

So the Commonwealth's leadership and money have proved to be, I think, quite important. This is not a challenge with the states about the sovereign right to water. It is about states coming together and constraining their self-interest to some extent because they recognise there is a greater good. But the degree of self-restraint falls unevenly across the states, so the Commonwealth's position has been to equilibrate that in some way. When the Murray-Darling Basin Ministerial Council met recently, on 9 May, they realised that this issue of where does the Commonwealth come in and how do the states cost share with that is a foundational issue, particularly given the questions you are asking about the degree to which the governments will have to buy the outcome. So they have asked the Murray-Darling Basin Commission to negotiate what cost sharing might be within about six months. The governments—and they meet next week as a commission—are going back and looking at the precedent that has been created from the way they have handled this in the past. They go back to salinity, where it was 25-25-25-25, but they are raising other questions because the equity issues in water allocation have fallen very differently to salinity.

**Mr SECKER**—South Australia gets six per cent of the water.

**Mr Goss**—Exactly. So if, hypothetically, South Australia were to invest a quarter of the money, where would it buy that water? It cannot buy it within its state, so it would have to look outside of the state and so on. They are incredibly difficult questions. The Commonwealth have in fact indicated publicly how they think about this matter of water in a couple of respects. When New South Wales were dealing with the Namoi overextraction of ground water, the Commonwealth took the position that they would not assist New South Wales because they saw that as a matter to be solved within New South Wales. But the Commonwealth, in response to the discussion paper of the Council of Australian Governments on the very question that you are raising, which is water policy, access rights and so on, have said, 'Where this is a matter of state government policy we have not compensated or assisted the states, but where community values have shifted appreciably then we will be open to that matter,' and they have made a public

statement to that effect. There is some precedent to this and, as Don said earlier, that is an expression of leadership, as the states individually cannot get most of these things over the line because of the way the equity falls. But the Commonwealth's contribution is absolutely crucial.

**Dr Blackmore**—It is the glue. In our basin the Commonwealth is the glue. I work all over the world in large river basins between countries, and some of the results are very disappointing because there is no sense of self-interest and, as a consequence, people erode the resource base until everyone is a loser. So eventually you have to get to a position where you can run the conversation to work out how you stream your resources to help communities.

Putting aside all of the negative things, because you cannot do it quick enough, you do not have enough answers, you do not have enough process and all those things, the positive thing is that we are an open democracy, we are knowledge driven, we will not take decisions behind closed doors, governments want communities to be stronger and not weaker—and they have said that publicly—and we want healthy communities and a healthy working river. Somewhere in there we have to get to what the deal is. So it has to be evidence based—and, quite frankly, with four governments voting on however you do it, you have got yourself I think a stable arrangement. It is actually more stable than doing it in isolation. So you have stability in terms of a long-term investment paradigm—at least the prospect of that.

If it goes for any of the higher numbers in our reference points—and goodness knows where it will fit; at 1,500 gigalitres it is equivalent to my rebuying 100 per cent of the Murray-Darling asset base: Hume, Dartmouth, 16 weirs and locks, barrages, salt interception schemes—and we invest that amount of money, whether through a market mechanism or anything else, it warrants a proper structural approach and the dignity of a decent professional investment paradigm with the resources to do it. If you do not do that and you think there is a silver bullet out there that will suddenly fix this, we are going to leave casualties everywhere.

**Mr WINDSOR**—It is not there.

**Dr Blackmore**—It just ain't there. We may think this investment paradigm is good enough for the nation and decide to go down that path, but it is very clear from where I sit that this is not rocket science; this is about three times more complicated. You do not have a bloody rocket standing over there that you can go and fiddle with and you do not have to talk to anybody. This is everybody's business; it is everybody's livelihood. I am trying to get people to think about the nature of the institutional form that will run that long-term relationship with our people so that, if we are going to support them in change here for a water dividend, they will eventually trust it. It is not four governments riding over the hill on white chargers saying, 'Woo-hoo, we are here to help.' It is a structured approach that we have made a decision about, we have a decent time frame and we are going to start bringing in the knowledge resources—and if we get off track there is a way to stop that and readjust it. That is the sort of long-term institutional form we need, and the only way that will get up across the states the way it is now is through the Commonwealth leading it, quite frankly.

**Mr WINDSOR**—Can I just ask this one question, because I think it is important—we looked at this in the Namoi ground water issue—and it relates to the property rights issue. When you bring that back to individuals and an individual is impacted by the change, there has to be a mechanism—call it adjustments, property rights, compensation or whatever you want to—that

does not just leave that guy out to dry. If you can take care of that individual who gets hurt by the change, you can sell the institutional arrangement, surely.

**Dr Blackmore**—Yes. I think in this game we cannot leave any casualties, and we do not want to leave casualties. The government have given a very strong message that they want healthy communities that will be more vibrant. The evidence of the last decade is that we have delivered over 15 per cent productivity dividend to these communities. They have delivered it. The whole shebang of the R&D agendas you funded has delivered it. So we can deliver it again. Some of it will come just by our creating more knowledge, better processes and all the rest of it. We do not want to leave casualties. A bigger risk, quite frankly, will be opening up the trading environment where a whole heap of people decide, ‘We do not want to be here anymore; we are much wealthier on the Gold Coast, thank you very much, so let somebody else take the opportunity,’ and gradually the supporting infrastructure for that area will be affected. The process will be slow, but we are seeing it happen now. Huge amounts of water have traded, and generally the adjustment occurred within the resources within those communities.

I think the issue for us is to find the paradigm to intervene that will not leave those—because we are not going to do a correction like the Namoi ground water. We have stabilised water access rights. We do not have any trouble with it. People might not like what they have got, but they have known for a decade in my world with surface water what they have got. It is not new. That is finished—all over red rover. So I am not going to set up a property rights regime to deal with, say, 212 people to fix up a ground water problem, whether it be for the Namoi, the Gwydir or the lower Bidgee. They will need to be tailored issues. There are people using 100 per cent of their access right, people using 10 per cent—you have to get in and fix it as an issue. That is not going to fix the 30,000 gravity irrigators. Everybody knows what their access right is, and it has been stable for quite a long time.

**Mr SECKER**—We have not talked much about caps today. There is the idea that plantations are taken into account with caps, presumably on the basis that they use all the water that falls there. How far do you take that philosophy? Do you say wheat crops use all of it when they are growing; pastures might use only five per cent, or 100 per cent if they are on flat land or 60 per cent if they are on hilly ground? How far do you take that idea of putting them into caps?

**Dr Blackmore**—You do not go down to that because once you go below 600 or 700 millimetres of rainfall it becomes a very small number. So it is hardly dominant. We have spent a lot of money with the CRC for Catchment Hydrology modelling this and it is important information for you, I think, because it really is one of the big changes. It is like what is happening in Victoria, where I chaired the farm dams review, which did not make me too popular, but at the end of the day anybody who wants to build a farm dam in a cap catchment now has to buy the water, other than water for stock and domestic use. That has now been challenged and all the rest of it. But it is important—there isn’t any more water. Somebody else is already using that water they want to store in that farm dam and put on their 10 hectares or whatever. It is a direct economic trade. We are at that point. Above 900 millimetres, 80 per cent of the water comes off 20 per cent of the catchment, and not much of it is in South Australia.

**Mr Goss**—Under a clause of the Murray-Darling Basin agreement, the commission assesses and advises on any action likely to impact on the flow or quality of the Murray River. For the reasons you have raised, the only way to administer that is to have some sort of trigger. So you



do not get involved in everything; you get involved when there is a reasonable prediction that an impact will exceed a certain level. That is the way we would apply the thinking in that case. There are changes in land use, like forestry, in the high rainfall areas that clearly would exceed some sort of trigger, as would dam development on the flood plains of northern rivers or the overextraction of ground water close to the river. But we have to operate on some reasonable trigger.

Even to know what the trigger is means you then have to invest in a fair degree of investigation to understand it. We have got to the point today where there is a reasonable understanding about the impact of forestry on surface water flow and security of water out of river systems. The CRC for Catchment Hydrology can now produce a reliability profile of water in the Goulburn River Valley on the basis of different forestry scenarios. When you get to that point, then you have got the basis for dealing with it. We are about to undertake the same for ground water because the South Australian jurisdiction has said, 'We believe this is an issue.' It has been agreed and we will go down the same path of understanding—

**Mr SECKER**—It has been agreed by the government. I do not know whether it has been agreed by the landowners, the forestry plantation people.

**Mr Goss**—It has been agreed by the ministerial council to investigate the issue, and the council has asked the commission to do it. So the process is very similar, and that is to understand what the impact is, then to see if there is some sort of trigger in there above which there really is an issue and then to propose a way of dealing with it.

**CHAIR**—Thank you very much. I am sorry to have to end it at this point. I have a page full of questions I have been writing down. I hope you will be able to find a bit more time to come back at the end of our inquiry. We would love to have you back. We have extended your time by nearly an hour, and we really appreciate it. As you can see, it is an issue that we are all really keen about and we want to see some resolutions, results and recommendations come out of this report. I thank you sincerely not only for your submission, which was extensive, but also for the extended time you have given us today. Thank you.

**Dr Blackmore**—Thank you. I want to make one closing statement. I do not think there is a more important and defining issue in Australia than this issue. I felt rewarded when I saw the Prime Minister put water and health as the issues. It is a very difficult issue because we are trading wealth. We might call it water, we might call it natural resources, but it is fundamentally wealth. How we tackle the issue will define us as a nation, in my judgment, because water is one of the few resources that will limit us as a nation—and it will limit us eventually. I wish you well in your inquiry and we stand ready to help in any way.

**CHAIR**—Thank you very much.

Resolved (on motion by **Ms Ley**):

That this committee authorises publication of the proof transcript of the evidence given before it at public hearing this day.

**Committee adjourned at 6.51 p.m.**

