



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

**HOUSE OF
REPRESENTATIVES**

STANDING COMMITTEE ON SCIENCE AND INNOVATION

Reference: Coordination of the science to combat the nation's salinity problem

THURSDAY, 30 OCTOBER 2003

WAGGA WAGGA

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HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON SCIENCE AND INNOVATION

Thursday, 30 October 2003

Members: Mr Nairn (*Chair*), Ms Corcoran (*Deputy Chair*), Mr Martyn Evans, Mr Forrest, Ms Grierson, Mr Hatton, Mr Lindsay, Mr Tony Smith, Mr Ticehurst and Dr Washer

Members in attendance: Ms Corcoran, Mr Martyn Evans, Mr Lindsay and Mr Nairn

Terms of reference for the inquiry:

To inquire into and report on:

The Commonwealth's role in managing and coordinating the application of the best science in relation to Australia's salinity programs.

In conducting its inquiry, the Committee will give particular consideration to the:

- a) use of salinity science base and research data (including the development of new scientific, technical and engineering knowledge) in the management, coordination and implementation of salinity programs;
- b) linkages between those conducting research and those implementing salinity solutions, including the coordination and dissemination of research and data across jurisdictions and agencies, and to all relevant decision makers (including catchment management bodies and land holders); and
- c) adequacy of technical and scientific support in applying salinity management options.

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Committee met at 9.07 a.m.**HULL, Mrs Kay, Federal Member for Riverina****WALES, Councillor Kevin Jack, Mayor, Wagga Wagga City Council**

CHAIR—Good morning. Before I formally proceed with this morning's second hearing of the House of Representatives Standing Committee on Science and Innovation's inquiry with respect to the coordination of science behind the salinity issue, I welcome Councillor Wales and Kay Hull, the federal member for Riverina. Each of you might like to say a couple of words before we get totally under way.

Councillor Wales—Thank you. I give this very important standing committee a very warm and sincere welcome to the City of Wagga Wagga. The City of Wagga Wagga are extremely proud of what we have done to combat urban and dryland salinity within this particular area. I know that you are going to have a look at some of the activities that have occurred here and I think you will find them very interesting. We seem to be a showplace for a lot of other areas that do not recognise the problems that salinity is bringing right across this country. Wagga is not the only place where it is happening. We realise that. It is happening right across a very wide area.

So far as our city is concerned, we have had tremendous support from both state and federal governments. Kay arranged a meeting with Senator Hills's office and we had a very good response there, as I mentioned to Gary. Then we went and saw Wilson Tuckey, and that was very interesting. Bryan Short, who is going to speak to you today, did a wonderful job in at least alerting Wilson Tuckey to some of the real issues and the way that we are dealing with them. Our state department have done a fantastic job, and you will see some of the ways and issues on which they have assisted us. Thank you very much for coming here. It is very important for Australia to really get to understand what the real problems are with this sleeping giant of salinity.

CHAIR—Thank you, and thanks for your hospitality here at the historic council chambers.

Councillor Wales—You are in a wonderful building here.

CHAIR—It is a lovely place.

Mrs Hull—I welcome the committee to the Riverina this morning. Wagga Wagga is a significant part of the Riverina. You are the science and innovation committee. If you want innovation with salinity, it is right here in Wagga Wagga; we are the forerunners and leaders, and have been for 10 years. When we were addressing urban salinity and the issues associated with infrastructure and the erosion of infrastructure, everybody else was putting their heads in the sand. Wagga Wagga put their hand up and said, 'We have it—we have this cursed disease.' They were penalised for it, simply because people do not really want to relocate to a place where there is the possibility of salinity eroding your infrastructure. Little did they know that this was the best place to be relocating to simply because we had recognised it, we had accepted it and embraced it, and we were addressing it. Those who were not addressing it still had that secret curse lying beneath and, at times, above their soil, eroding their infrastructure and costing them

millions and millions of dollars, because they were not willing to embrace the problem or be open and honest about it.

We think we are the leaders. We think we should be established as a pilot project in order to teach the rest of the Australian local governments exactly how they can manage salinity, how they can be proactive and productive and keep their community safe and free in terms of their infrastructure for many years to come. Thank you for visiting Wagga Wagga. It is the typical place that you should visit in order to see the innovation that has been around for a considerable number of years. I thank the chair and the committee.

CHAIR—Thanks very much, Kay. I know you have to be in Narrandera in an hour's time so you will be heading off shortly.

Mr LINDSAY—I would like to make a short statement. I apologise to the committee for being a tad late. I have just spent about an hour and a half at Kapooka. As my colleagues will know, I do a lot of work in the defence committee. That base is a great credit to Wagga and the Australian Defence Force. What they do is fantastic, and the chapel is marvellous. I think it is the best chapel in the ADF—and here it is in Wagga. Well done, Kay. It is a great facility. Never lose it.

Mrs Hull—Never.

Councillor Wales—It is 10 years old on Sunday.

CHAIR—That is an extra bit of publicity for the region. As I said earlier, this is the second public hearing of this committee on this inquiry. On 13 August the committee was asked by the Minister for Science, Peter McGauran, to inquire into this issue. The inquiry was advertised nationally and written submissions were sought from interested departments, organisations and individuals. Our focus is on managing and coordinating the application of the best science in relation to Australia's salinity problems. We are certainly pleased to be here in Wagga, where there has been quite a lot work done to take our investigations further. We will now call our first witness today.

[9.13 a.m.]

CLARKE, Mr Sydney Ralph (Private capacity)

CHAIR—Welcome. Although the committee does not require witnesses to give evidence under oath, the hearing is a formal proceeding of the parliament and I would remind all witnesses that the giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament. I also remind you that the committee prefers all evidence to be given in public. However, at any stage you may request that your evidence be given in camera and the committee will consider your request. Do you have any comments to make on the capacity in which you appear?

Mr Clarke—I suppose I appear because I was selected. I am a dairy farmer by trade. I am in the Kyeamba Valley Landcare group. I do not particularly represent that group, but I do represent the community out there. We have been involved in this issue since probably before the city of Wagga became involved and began what it has been doing in recent times. Since 1988 we have acknowledged that we have that salinity problem and have been addressing it.

CHAIR—Mr Clarke, we thank you for being here today. I know you have not put in a submission, but you came highly recommended from the region as somebody who has been very much involved through Landcare, your own property and other aspects for some time and as somebody who would be able to give the committee very much a grassroots view of what has occurred in your particular region. One of the aspects that this inquiry will be trying to achieve is to determine whether the information is getting from the scientists doing research et cetera through the various government organisations and down onto the ground, whether it is being implemented on the ground and whether people like you have access to that information. That was why we asked you to come along to the hearing today. This afternoon we will be partially inspecting your property to see some of those works on the ground, and we thank you in advance for assisting us in that way. As you do not have a submission, perhaps you might like to say a few opening words about some of your experiences, and then we will spend a bit of time asking you questions to see how you can help us.

Mr Clarke—With regard to the activities I have been involved in on salinity issues, we recognised we had a problem back in 1988. Salinity was not really known as it is today. It was certainly not known to the extent it is today. The actual problem was not even pinpointed then. We, as a group of farmers, got together to try and innovate and do something about it. That really started off our Landcare group. What was needed was a bit of science, and science was not really available in those days, so we had to go with what we had. We had to go to the department of land and water and try and get some of their technical advice to begin to do some remedial action. That is probably the origin of it. As you know, as we speak today science is still trying to come up with the best management practices or the best activities to try and get on top of the problem.

I said that there was no science out there when we started. We used people like the department of land and water, agronomists and so on to activate some immediate remedial action. That process included—and I guess you are fully aware of what goes on—the insertion of things

called piezometers, which indicate the level of the watertable and its rate of rise. What really stirred us up was that a company called Geoterrics did an airborne survey with an EM machine. A land-borne survey was also done. They came to the same conclusion—that the watertable was rising by one metre per annum. That was pretty scary stuff, because in our case, as an example, we had one hectare of affected land in the first year. In the second year it was two hectares. Then it was four, then 8.

My wife and I could see that the whole place was going to be bare in a very short time, and that is the sort of thing that drives you. Something good has always come out of any devastation that has occurred around the world, and in this case the devastation spurred a lot of innovative ideas—certainly the ideas of farmers—about how to get on top of the problem as an initial outcome. Whilst we are doing things, it must be recognised that science is also doing things. Certainly the advent of satellite imagery, mapping and all that type of activity has aided our endeavours to get on top of the problem. It might be better if you were to prompt my thoughts by asking me questions.

CHAIR—Thank you for that introduction. You mention the information that is now available—the satellite imagery et cetera. How are you involved with that? Has it been easy to access that sort of information in a form that is relevant to what you are actually doing on the ground?

Mr Clarke—I think both parties have to recognise that we have all got roles to play. I think that the science part of it, whether it be through the department of land and water—or DIPNR, as they call it now—or through CSIRO or the like, is only one aspect of it. The application aspect is what the farmers can and cannot do and I think we have got to go hand in hand with each other to apply the science on the ground. And then there is the affordability of the whole process. It is fine to have the best knowledge and the best science available to actually get it on the ground. As Kay Hull has pointed out, if we have a demonstration site large enough then we could throw a lot of resources at it. Sure, all the outcomes are not going to be as good as expected, but isn't it part of the process that we learn from mistakes? I think that is what we have been doing—having a few mistakes, that is.

CHAIR—The role of the extension officers has been raised with us by various people. We have heard from some people that they are often reasonably fresh out of university and maybe do not have the practical skills and therefore are looked upon with some suspicion perhaps from farmers. What is your experience in dealing with those sorts of people?

Mr Clarke—I think I said at the beginning that we had to rely on some sort of formal background, and DLWC was the formal background in our case.

Ms CORCORAN—I missed your word. Who was the formal background?

Mr Clarke—DLWC, Department of Land and Water Conversation, which is now DIPNR. I am sorry about the acronym—you pick up the terminologies as you go along. We did not have the expertise; we did not have the science, so we had to rely heavily on those people. Again, they have to attract the respect of land-holders. They just cannot come out and whack you across the back of your head with a lump of four by two, as I call it, and say, 'Do this or do that.' The people I have been involved with in the local office here, I feel, have been excellent because they

encourage. They had the maps, they got people with expertise out and they talked to land-holders.

I think a lot of land-holders learn from each other, but a lot of land-holders have also inherited—I think that is a better word—some of the ideas from their forebears. I had parents, for instance, who said, ‘This is the way you have to farm and until something happens, this is the way you do farm.’ I think it has taken a lot of subtle discussion from these people to realise that that is the case and they just cannot come in and hopefully change things overnight. I feel that the people here have been extremely good at getting to the situation and recognising that it is okay, we have got a problem, but you just cannot change your land management practices overnight. So slowly the wheel has been turning and, if you turn the wheel slowly, you also attract a bit of moss—the moss being the farmers.

I have had a lot of farmers come to me and say, ‘I haven’t got salinity.’ Then they see by going around that maybe the signs are there. So they will not come out and say, ‘Yes, I have got salinity,’ because it is an issue with them that the value of the land will go down. Also, their expertise is then questioned by their neighbours if they have not done anything about it. So little by little, through the exposure through farm walks and the like and through using these people—‘using’ is not quite the right word—or with the cooperation of these people, that has enabled those farmers to back off another step and say, ‘Maybe there is something in all this stuff and we have to look at it.’

I think the greatest thing in our case in Kyeamba has been the busloads of people going around and seeing the sites and the farmers themselves talking about it, with the department of land and water people are aiding and abetting a land-holder to deliver something that he never knew about but also something that they did not know about either. It is a learning curve for both of us. Certainly they have got their hand in the science block and they could deliver the scientific part of it to the farmer.

Ms CORCORAN—I am interested in when you first got started and now. What is your experience in getting access to scientific information? Is it there for you to pick up easily? Is it hard to find? Are scientists working on projects that are useful to you? We are interested in the whole link between the science that is being done and how it is being used on the land by people such as you.

Mr Clarke—Farmers have got to run their land to make a living, the same as with any other business. There is the question of how much they can take on board and how much they go and search for. I guess with the advent of computers these days, the web site and all that, they could do it, but time is of the essence and most of us have limitations on our time. The only way I find I can access a lot of things is to read. I read a lot of reports, but I am also fairly cynical and critical about those reports, and I think farmers have to be. Some scientists—and I am not saying all—tend to think in one straight line. They are a bit like farmers: they will not change for whatever reason. But I think if you can be critical about what they have said in a text like that, and with some justified reason, then they will take notice.

Ms CORCORAN—Have you ever been in a position of wanting the scientists to do something for you and have you been able to get that done?

Mr Clarke—Yes, I suppose I am fairly innovative in that if it has not been out there I will go and try to do it myself. Most farmers do that anyway.

Ms CORCORAN—Do you do it physically yourself or do you get a scientist to come?

Mr Clarke—Physically, personally and financially.

Ms CORCORAN—So the flow of information is very much one way, from the scientists to you, and you read that and judge it as you see fit.

Mr Clarke—Yes.

Ms CORCORAN—But there is no flow back the other way? You do not have any way of saying to the scientists, ‘I would love you to do research on this’?

Mr Clarke—I think a lot of things happen in your lifetime but it is slowly by slowly—you cannot cure all ills in one day. We have had a problem with the dairy farm, for instance, on waste management control. When I took over the family farm some 16 years ago I went to DLWC and said to those guys, ‘What do I do about it?’ Out of that, I was able to source funding from the New South Wales Environment Trust, so I set up two models. I became involved in the other side of things. I become involved from the practical side of the applied science. I was then invited to become a person who aided and abetted in putting the guidelines together. So it is quite different for me, a farmer, to suddenly become an active part in the science of it all. But I am keenly interested in geology and hydrogeology, soil science and the whole lot. I have got a project running at the moment which I will tell you about when you get out there.

Ms CORCORAN—Are you typical of the farmers in your area or are you a bit ahead of a few of them?

Mr Clarke—Maybe I am a bit ahead of some of them.

Ms CORCORAN—We heard yesterday from some of the New South Wales departments that on their web sites there is access available to all sorts of scientific information. Have you ever used them?

Mr Clarke—No, because I am computer illiterate. I can now start the computer up, but I have not got that far. I think, too, that because I work in the paddock most of the day I have a lot of time to think, reflect and observe. That is our advantage: we are out there with the science all the time. You take a lot of stuff on board that you do not even think you are going to need later on in life: it was just an observation, but, when there is a puzzle that you have to try to solve, it comes to you suddenly—just like that. It is already there, because you have seen it. It is just a matter of jiggling it all together.

Ms CORCORAN—Thank you.

Mr MARTYN EVANS—As a very early starter in this business, you were obviously one of the first from the farming community to really come to grips with this, so you have had a long experience in it. How would you say that the science advice and the advice from the state

department officers here—whom you say, and I agree, have done a very good job out here—have changed over the years? You would have got some advice in the very early days about what to do in terms of the mapping and the readings to take. Would you say that you have got a very different kind of advice or do you think the science underlying it has dramatically improved? Can you give us a bit of a feel as to how that has changed? You have been in it right from the beginning. Have you had the feeling that the science underlying the advice you have been getting from the department and the people involved has ramped up? What is your feeling for that over that long period of time?

Mr Clarke—To put it in layman's terminology, it is a bit like the Indy 500: you just got out there, cruised up to the starting point and then tramped the pedal. That it about how fast it is going at the moment. In the early days, as I said, there was very little that we could find out. Now it is 15 years on and it is coming at you from all directions and going at the rate of knots. You will see this this afternoon. I am involved with the Melbourne University at the moment. It is to do with a satellite being launched from Russia—I think it is about now. Their proposal is that they will send up two satellites. I think the project is called GRACE—that is an acronym. These satellites will be about 500 kilometres out. They have got different sites all over this area and, I think, up in the Lachlan. They will beam in and ascertain what the water activity is under the soil profile. It is quite innovative and I am really excited about it. To have one of these things on my place is the bee's knees. Again, it is an acceleration of science. Some people cannot cope with that. But if you are actively involved in things, as I am—and I just love that sort of stuff—it is just like bread from heaven.

Mr MARTYN EVANS—Has that involvement come through the local department officers here?

Mr Clarke—Somebody has got my name on some lists somewhere in Canberra, Melbourne and Sydney—all over the place. They came to me and said, 'Will you be involved in it?' I said, 'Yes, sure.' It is what I want to do. It is part of the science, and it is getting into the hydrology part of it. We have got aquifers which are in different layers. If I can interest people in becoming involved in my place then that speeds up my knowledge. There is lots of stuff out there that I do not know. I cannot find out why this or that happens, like why springs run while other shallow wells have dried up in the last drought. Our irrigation aquifer did not dry up and the watertable has risen to such an extent that the standing water level was only about 30 feet, say, last year and now it is 18 feet. Why it has come up I do not know, and nobody can tell me.

Mr MARTYN EVANS—You seem to be getting that information from a variety of sources. I just wonder how the coordination of that might be improved a bit. You are very well informed about it—probably one of the best informed in the region. As a dairy farmer you are perhaps well placed to be at the focal point of that information. Perhaps some of your colleagues may not be so well placed. You are actively seeking that. What about those people in the farming community who are perhaps not so well placed to receive it? They might need a little better coordination in that context of the information flow. Given that you have been exposed to such a range of it, how would you rate that? If we were looking at ways of getting information out there, where would the best coordination come from?

You have probably met the local extension officers, the Department of Agriculture people, the university people and the CSIRO officers—and more. Your colleagues are perhaps not so

focussed on the issue. Many of them probably do not relate so well to the Internet. Even though the Internet is promoted for agriculture, finding scientific information on the Internet about something as complex as salinity is not easy. It is one thing to go to the *Country Hour* web site and so on and get stuff, but science information on things as complex as salinity is more difficult.

Mr Clarke—We are fortunate in Kyeamba that we have a structure in place. We have the Landcare group running. We have technical people here in town. One of the major issues which comes up is getting the science from the knowledge base to the farmer through some sort of activity. That activity has to be Landcare. Having said that, there are limitations to what people can do from DLWC. In Kyeamba we have had a Landcare coordinator for a number of years. Unfortunately, some people out there have decided that funding might be better spent somewhere else. We believe that farmers have not got the time to do what I do. Certainly, we need a coordinator to transport the science from the science block, so to speak, to the farmers through the medium of Landcare activities in a Landcare group. So it is imperative that we keep coordinators to assist in getting the science to the farmer.

Mr MARTYN EVANS—You have a lot of information now about your property. You keep building on that information year by year, and it keeps changing from year to year. The watertable is moving. The level of salinity readings, the EM readings, will change, and you will get more information from the satellite, presumably—data. You have the LANDSAT data. This is a lot of information about your property, and some of these properties can be quite large. Obviously a dairy farm is not on the same scale as some of the other properties. You know your farm very well, but this is on a more general scale. We are talking scientific information, which is obviously some fairly complex facts and figures and detailed scientific readings about the individual sites. It might run into the hundreds of samples around the fields. How do you, as an individual, retain and keep track of that data? You obviously know a fair bit about it on your property, and you have told us some of those figures today off the top of your head, but you cannot do that on an ongoing basis. What is your methodology for keeping track of that? Do you rely on printouts of maps? Mapping is a very good way of showing things—coloured maps with the readings and stuff—but you obviously cannot generate those on farm; you must rely on some other source. What is your technique for this ever growing information about your property?

Mr Clarke—It is probably fair to say that because of the activities that happen at home and because of my involvement, I tend to get mailed a lot of information from a lot of sources—not that I go looking for it. I will give you an example. Whilst we were processing the business of our Landcare group, we were actively invited by the Murray-Darling Basin Commission to put together the land and water management plan, which we did. Again, we were helped by the department of land and water, and Agriculture as well, but it was a combination of all the farmers and their concern and their acquired knowledge. A lot of those people did not realise they had certain expertise that was never even touched upon. Not only did we help with the land and water management plan; we also put together a cost sharing agreement and we did a socioeconomic evaluation. Having done all that, how do you give that to a farmer? I was fortunate enough to be in the chair in the second term—I spent four years in the chair of the Kyeamba Valley Landcare group—and I thought through this issue. I had another idea—the *Landholders Guide to the Land and Water Management Plan*. It is in simple terms. It takes the technical jargon and puts it into layman's terminology. This committee should take on board

those comments. The farmers are going to take a lot more notice if you can get the scientific jargon out of the way and put the information into day-by-day terminology.

Mr MARTYN EVANS—But you are still going to end up with a lot of data about your paddock, about your piece of dirt, aren't you?

Mr Clarke—Yes.

Mr MARTYN EVANS—With detailed figures about the salt readings and about the depth of the watertable this year and next year and next year. That has to be translated so you can see it change from 2001 to 2002 to 2003. Is the salt getting better or worse? Are you winning or are you losing? That has to be related to each farmer's individual property in hard data, in real terms that they can see and follow. You need a graph, or red going to pink going to blue. That has to show on his piece of land. That would be very helpful to us and a very useful document for people about the terminology, the planning and the general trend. But how do you relate to your data on your land?

Mr Clarke—Just take it a step back. What I have overlooked is that, through the process of pulling all this together, one of the best things that came out was the start of the planning issues—getting the farmers to do the farm plan. Probably about 80 per cent of the valley farmers have done that. That is the basis, and you build on that. You can accept the technology which comes to you from the additional ongoing science. If your farm is in a condition that does require that sort of science—and not all farms do—you just have to take whatever is needed. It is like having a medicine for whatever ails you—but there is no point in taking aspirin every day of the week if you do not require it.

Mr MARTYN EVANS—That is fair enough.

Mr Clarke—As far as getting an outcome, it is different from farmer to farmer. You say, 'Ours is a dairy farm', but it is probably bigger than most. We acquired another piece of salinised land beside us last year. It is now about 350 hectares—so it is probably bigger than the average. It is the affordability to apply the science. One of the major issues at the moment is if a scientist says, 'Go from 1 December this year,' you are going to look back and say, 'How can I go? There are depressed wool prices now, and certainly depressed milk prices.' The affordability of doing things has been minimised. It is very hard to apply the science on the ground.

Mr LINDSAY—Mr Clarke, was it 1988 when you first determined there was a problem?

Mr Clarke—Yes.

Mr LINDSAY—Have you found yourself feeling cranky and frustrated at times and, if so, can you describe why you were cranky and frustrated with this issue?

Mr Clarke—I am half Irish—my dad came out from Ireland at 16. Maybe that answers the question; maybe that is another reason why I tend to be like I am. I was frustrated in as far as there was not enough there to get on with the job. Sure, we got a salt action grant of \$5,000, and it was the first one to come into the valley. Sure, I have been involved in the national salinity program and I have been to Dubbo, to the summit up there, and all that sort of stuff. I was

frustrated up there because I was told to sit down and be quiet until I was asked to make a statement. And that is all it was—it was a statement. The frustration in those early days was that there was not enough information out there, not even with the agronomists. In hindsight, there is no reason they could give me that information because it was not there. The frustration was that I either had to accept what they said or do my own thing. So I compromised, and I will show you why, and it worked.

I also believe out of all this frustration that you have got to settle yourself down. The science is coming at you from left and right and all the rest of it, and recommendations are coming down like this. But, at the end of the day, you have got to make the decision about what you do. My wife and I decided that if we accepted the trial plot of the \$5,000 through salt action to do 20 acres, by the time we got an outcome from that this bare patch could be all over the farm. So we said, 'We've just got to bite the bullet.' So we bought a direct drill and we have changed our mind-set from the best method that we used to know to the way we do it now, and we got on with the job. We are so grateful that we actually put the pedal to the metal, so to speak, because we have been able to achieve something that perhaps a lot of people have not been able to achieve. Along the way, we have had thousands of people visit the farm, and a lot of questions. A lot of those questions have prompted your mind as well to think that perhaps there are some simple answers out there that even the scientists have not thought about.

Being half Irish, I am a fairly simple person, but what I have done is turn the issue around. I have looked at salinity. Salinity is the outcome of high watertables. So, just to be quick about the whole thing, isn't the high watertable a resource? So, if you put your mind around it, why not use this resource? What we did was sow the whole farm down to a permanent pasture which was salt tolerant and we utilised that resource. What we are doing is harnessing and harvesting the high watertable. Forget about the salinity issue. It is another way of encouraging other farmers to do the same sort of thing.

Mr LINDSAY—Do you get frustrated that what you find practically on the ground there is no mechanism to channel back up to the scientists?

Mr Clarke—That is a good point, because that is exactly right. Is it because the scientists are a bit nervous about coming into the paddock and asking a farmer? We are a bit nervous about asking scientists about things. I think both of us have got to reach common ground. This is why I open up the farm to anybody that might wish to be involved. Certainly the agriculture research guys are all over our place. The department of land and water guys are all over our place. I think that, again, is a way of breaking the ice. I think it is fine to have something scientific in a little glass, but why don't we have it on a farm scale or a catchment scale?

Just harking back to, say, 1991-92, we tried to drive it to the Murray-Darling Basin Commission that we needed a model. We sat down and did the sums for a socioeconomic evaluation and cost sharing agreement—all that was done. The science was done with the land and water management plan. All we had to do was supply. We recognised we needed \$15 million. We needed \$3 million from the state and federal governments and the rest would come from farmers and/or in kind. But they thought that was just too hard and they just canned it. That is the frustration. I believe we would be miles ahead now if they had pulled their finger out, figuratively speaking, and got on with it. We would have been streets ahead.

Mr LINDSAY—To summarise all of that, as a practitioner on the land do you think right at this point in time that there is adequate flow of information from science to you and there are now adequate opportunities to flow information from you to science? Do you agree with that? Say no if you do not.

Mr Clarke—No, I do not. The scientists have not approached us and said: ‘What have you done? What have you achieved? Can we have a look?’ That has not been done yet. That is a complete frustration.

Mr LINDSAY—You referred to some loose-leaf papers that you had there—some articles and so on.

Mr Clarke—Yes.

Mr LINDSAY—Are they all Australian papers or do you get information from overseas?

Mr Clarke—All the stuff that I get is Australian.

Mr LINDSAY—You do not look for world’s best practice because you think that what Australia is doing is what you need?

Mr Clarke—I will just give you an example of why I do not. Seed companies love to sell you seed, and they are going to tell you the yields are this, this and this if you use this variety, that variety or that variety. That is fine, but do they work here, on our land, on our soil type? That is why I would not go to America because I believe the soil types are different, the topography is different and the hydrology has got to be a little bit different. There is a similarity, I guess. I am not a hydrologist, but my gut feel tells me that we are in a unique situation in Australia with the land mass we have got and it is quite unique in its make-up.

Mr LINDSAY—Thank you for that.

CHAIR—Mr Clarke, I see this land-holder guide to land and water management was put together with funding under the Natural Heritage Trust predominantly and the Murrumbidgee Catchment Management Committee. Is that right?

Mr Clarke—That is right.

CHAIR—You said it is in the language that a farmer can understand, that it is taking the science and putting it in a language that can be understood. Who actually did that? Just quickly take us through how you achieved it.

Mr Clarke—We had to do it correctly and make sure the technical aspect was still there. We did it through the aid and assistance of our landcare coordinator—it was actually through two coordinators at the time, because one was just going out and one was coming in. With their expertise they were able to do the actual leg running, because they had to make sure that everything was correct. The way we did it was that a lot of the subject matter was bounced off the department of land and water. The committee themselves, being all land-holders, were given sections to actually go through and study to recognise if there was any activity or methodology

in there that was not correct. So we had a mix and match, and I guess that was the best outcome. I am pretty proud of the whole result. We got Kay Hull to launch it at the Forest Hill school. A copy has been given to the New South Wales Select committee on Salinity, which came through about 12 or 18 months ago now, so that committee has a copy as well. I am quite proud of it and I feel the reflections in that are a true indication of what we have been doing and also of what can be done.

CHAIR—Did copies of that go to every land-holder in the area?

Mr Clarke—Yes, all the ones in the Kyeamba Valley.

CHAIR—That is excellent. In relation to the various projects funded under the national action plan in New South Wales in 2002-03, there were about 17 projects totally about \$14 million. I see one of them is the Kyeamba Valley Targeted Salinity and Water Quality Control Program, with a bit over a quarter of a million dollars allocated in 2002-03. Presumably you have been involved in that project?

Mr Clarke—Yes.

CHAIR—Could you explain to me how that project got to be funded under the national action plan?

Mr Clarke—The mechanics were that the applications were forwarded out and you could apply, and we duly applied for that.

CHAIR—Did the Landcare group do the leg work to put that together?

Mr Clarke—We were assisted by the Department of Land and Water Conservation, as far as I know.

CHAIR—We are trying to get a feel for how this national action plan is going, how the projects are being selected and what is backing them up. It is good we have found one that somebody is involved in.

Mr Clarke—There is funding at the moment of \$511,000 which came into the valley.

CHAIR—The \$255,000 must be the Commonwealth's share of it.

Mr Clarke—It may well be. That is a precursor; I guess I was the driver of that. The NAP was coming through—it has been touted as the best thing since sliced bread—but we needed to get on with it. Again, I coordinated the activities between the mayor and DLWC and the like, and we got that money coming through. It is being applied in a different fashion now. I think you will be told about that this afternoon. A young fellow, Rohan, will probably explain that to you. Every farm in the targeted portion of the valley—it is a target area rather than the whole blanket valley; they have recognised through the mapping that there are target areas, and we are in part of that—is able to put in a submission and, again, I think Rohan is doing all the submissions. You put up what you want to do and work out how much it is going to cost. Getting back to the actual cost sharing part of it, because of the downturn in the rural economy it is now recognised

that what has been done in the valley, either the permanent pasture or the trees that have gone in, should have some sort of cash fall recognition. That is an in kind contribution and it is worked out on a \$6 a hectare basis on permanent pasture basis for 10 years, or something like that. For a project that is going to cost a farmer \$20,000, his contribution might be half that. It may be made up already in kind by his permanent pasture or his trees.

CHAIR—You are confident that there is appropriate scrutiny of the individual things that are being done, that they are based on a good science to get that funding? It is not just a case of, ‘I want to get some trees planted here or some fencing off of this area there,’ and because it is in this region you get funding for it? It has got to be a close scrutiny of exactly what that work will do and how it fits?

Mr Clarke—The available science has already dictated the terms. Not only does it dictate the terms, it makes it a little harder for the farmer as well. He now has to contest for that funding. If, for instance, the \$500,000 budget has gone over by \$100,000 there has to be some people weaned off the application list, and so it is a competitive thing. I am quite sure that the committee, which is mostly made up of the farmers themselves, will prioritise where the hotspots are. The intensity of looking at hot spots rather than a blanket form is now, because of the science, going to be activated.

CHAIR—Thank you very much for your time this morning. We very much appreciate it and we look forward to having a look at some of this on the ground this afternoon.

Mr Clarke—Thank you.

CHAIR—The exhibit *Landholders Guide to the Land and Water Management Plan* provided by Mr Clarke has been received as evidence and is authorised for publication as an exhibit.

[10.00 a.m.]

DAWSON, Mr Anthony James, Landscape Manager, Murray Catchment Management Board

CHAIR—Welcome. Are there any comments you wish to make about the capacity in which you appear?

Mr Dawson—Thank you. I am here representing the views of the Murray Catchment Management Board. I am employed by the Department of Infrastructure, Planning and Natural Resources but my key role is to act as an executive officer for the board.

CHAIR—Although the committee does not require you to give evidence under oath, the hearing is a formal proceeding of the parliament and I remind you and all witnesses that the giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament. I also remind you that the committee prefers all evidence to be given in public; however, at any stage you may request that your evidence be given in camera and the committee will consider your request.

We have the submission from the Murray Catchment Management Board—submission No. 10. It has been authorised for publication so it is now on the public record. Would you like to make some opening comments before we proceed to questions?

Mr Dawson—I will make some background comments on the journey the board has made over the last year or two in developing our catchment blueprint, which we hope will go a long way towards addressing some of our salinity issues in the catchment. We have problems, like most of southern New South Wales, with dryland salinity. Knowing what to do with it has always been a bit of an unknown science. That is the nature of the beast: salinity is an extremely complex issue to deal with and picking the right science—if there is such a thing—is a bit of a minefield. I think the Murray board has used the best science available and we are confident that what we are proposing will achieve what we desire in the next 10 years, given the funding that will be required to address the problems.

We started by looking at water quality across the catchment: what was actually happening, where the salt was coming from, what were the salt sources and what were the trends. Our next step was to look at a range of methodologies on how we could address that and at some of the things we have looked at. We built on that catchment characterisation that had been undertaken and developed up. That really looked at ground water flow systems. We drilled down within our catchment and came up with what we believe would be the ground water flow systems at a 1:100,000 scale. We undertook some other studies. We looked at salt sources. We looked at salinity risk and a range of actions based on technical teams as to what we thought would be the best mix in each particular landscape unit to address salinity.

We undertook a lot of public consultation through that process and there was a lot of scrutiny and feedback. Eventually that is enshrined in the Murray blueprint and that is what we are heading towards now. One of the things that came out through that initial study was the clear

lack of data. That is the one thing we are all grappling with in this science question—good data, whether it is long-term water quality or knowing what is under the ground. We often do not know.

We have finished that process but now there are other things happening around us that we are aware of. Airborne geophysics is being touted as the saviour. We are still to be convinced of that. We believe it certainly has applications in some areas but has a deal of limitations in the hard rock areas. Again that is only our opinion based on the best information we are getting from our advisers. Again, there is this conflict of information: whom do we believe? That is one of the themes of our submission: we believe there needs to be some peak group with a role in deciding what is scientifically validated, that is, what works at what scale and what the limitations are. Too often there is a lot of self-interest out there and a lot of people are promoting their products and their methodologies and blowing it up bigger than what they can actually produce.

Another problem we have identified is a lack of sharing of information. We are all guilty of it. We have gone down a certain path and we are quite pleased with it. I believe the Murrumbidgee has done a similar process but I am not sure what other catchments in this blueprint development have undertaken. Even in my little world I can see this lack of sharing of information. I am sure it is broader outside my world. On a national scale it would be significant. We are happy where we have got so far. We believe we are going down the right track. As information and new technology becomes available we are questioning who we should be looking at. As a board, should we be reviewing our systems or who is to tell us whether it is the bees' knees or what scale it should be? Often salinity can be addressed only at the local level. Syd made the point quite succinctly that often salinity can be addressed only at a local level. There are local solutions for local problems in many cases. Certainly the broad scale that we were developing up should only be looked at as a broad picture.

CHAIR—You expressed some hesitancy or doubt about airborne geophysical methods and you briefly said something about hard rock. It is technology that the Bureau of Resource Sciences is backing quite strongly for identifying salt stores and underground drainage lines. If we cannot put some sort of confidence in a peak body like the Bureau of Resource Sciences then how do we come up with some sort of better panel to advise about what should be the best?

Mr Dawson—Maybe it is because of a lack of knowledge of that science. In our Murray catchment situation, it came over the top. There was very little consultation. I know some areas of our catchment were flowing. The first we really knew about it was that there were people out there talking to the Landcare groups saying, 'Look what we can do for you.'

CHAIR—Who were those people? BRS?

Mr Dawson—Peter Baker.

CHAIR—Where is he from?

Mr Dawson—He might have been one of the proponents of this airborne geophysics. Again, I am not sure.

CHAIR—You do not know who he works for?

Mr Dawson—No.

CHAIR—So what you are saying is that this work was being done, but there was not any liaison with the catchment management board?

Mr Dawson—The board was supposedly the group that set the whole catchment direction. There was this thing going on. We certainly had not had a briefing on it and had no information relating to it in the two or three years I have been involved with the board.

CHAIR—In one of your recommendations you talk about the need for a web site to enable ‘access to validated and easily understood documents that synthesise research and knowledge’. Yesterday we heard from the New South Wales government and, in their evidence, they referred to CANRI. Isn’t that what that is?

Mr Dawson—To a point. I am familiar with the CANRI site. It is more the data sets at a pretty broad scale that are available. Our reference to the web site included that data at a national scale but also a lot of the science papers that sit behind it. I thought we made the point that the practitioners or the planners often do not have the time, the energy or even the ability to wade through a 3,000-page scientific document to decipher what it is all about. What we propose on this side is there should be some central repository where a lot of that scientific information is condensed down to layman’s terms.

CHAIR—So the CANRI site is just a bit of a portal off to actual source documents and things like that?

Mr Dawson—Yes.

CHAIR—Are you suggesting that such a repository should be on a state basis or a national basis?

Mr Dawson—I think the one site should be the national basis, no matter where I am. If I want to drill down to a certain location to get the data, that is fine, or if I want to get a feel for what is happening nationally or even internationally as far as the latest research on a number of techniques or technologies, it would be fantastic.

Mr LINDSAY—Do you have any issues where the cost of data is a consideration to your organisation?

Mr Dawson—That is the whole problem we are facing at the moment. We all know that data collections are often expensive and, more importantly, require a longer term commitment. Unfortunately, if these research bodies are looking for outside funding, we are often working under a one-year, or three-year at best, funding cycle, so there just does not appear to be that commitment by government, whether state or federal, to commit to a long-term program so we can get that information.

Mr LINDSAY—So is your evidence to the committee today that the cost of acquiring data for your local region or catchment is an impediment to delivering scientific outcomes on the ground?

Mr Dawson—Absolutely. All the new programs and model programs that you see coming to the fore now have been built on data sets, and the integrity of some of those data sets can be questioned. What is more, lots of models are now being developed—I am talking about salinity management—using modelled information and other data sets. So if there is an error back there, that error tends to be magnified time and time again.

Mr LINDSAY—That leads into another issue I want to explore with you. Your written evidence talked about a conflict of ideas, effectively, whereby it was hard for you on the ground locally to resolve the fact that different scientists had different views of the same issue and you were getting conflicting messages. How do you currently resolve that, and what do you think should be done to resolve that?

Mr Dawson—The board relies pretty heavily on local experts who have a local understanding and are probably used to working on a catchment scale rather than on the broad-brush national scale of the new systems that are coming in, like the Catchment Characterisation Program. Again, we applied that using local expertise to divide the Murray catchment on a scale that fits our needs and has a lot more local application.

Mr LINDSAY—Because you say that you are picking up a conflict of ideas, I take it that that means science is getting from the boffins down to your level—this is one of the things the inquiry is looking at—and getting down in sufficient quantity that you can pick up the fact that there are different suggestions as to how to deal with things and whatever. The delivery of science to your board is not an issue for you? You can get what you need—is that the situation?

Mr Dawson—Airborne geophysics is a good example of where it may not be working. The board went through a two-year process of developing a science that applied to the Murray catchment. This airborne geophysics has come in over the top of that. The message I am hearing that this program can deliver does not necessarily agree with what we have developed, but I still have more confidence in the science in the processes we have used.

Mr LINDSAY—You recommend a knowledge exchange program. Can you give the committee any ideas on how that ought to work and how it should be set up?

Mr Dawson—I guess that comes from this lack of communication. There is probably some fantastic new science being developed elsewhere, but it does not seem to flow very easily. So we had this notion that maybe we need knowledge brokers, who might sit within a catchment. They are the ones who have their finger on the pulse of the new science. If it is airborne geophysics, as soon as it is flagged they would be the ones who would probably explore, inquire, decipher and then bring it back to the catchment and say, ‘Maybe we should be looking at this or maybe we should be looking at that.’ The agencies have a certain role in that, but we need a group or a mechanism to make it happen.

Mr LINDSAY—Will that be nationally based?

Mr Dawson—Again, why not? The states should not be working in isolation. We should be sharing whatever information and science we have got.

Mr LINDSAY—If it were set up nationally, do you think your board would be prepared to contribute to the cost?

Mr Dawson—The board has put that in the submission—so, yes, I would agree. That cost needs to be shared equally amongst the states and the authorities.

Mr LINDSAY—Thanks.

Mr MARTYN EVANS—We spoke earlier about the cost of acquiring data now from current techniques, and the prohibitive cost of long-term research programs. What about the cost of existing data—data that is already out there? The state has topographical information which is currently on state-wide databases, and that is pretty expensive to acquire. Mining companies have acquired a lot of information about salinity in bores that they have drilled. A lot of existing information is on state government data sets and so on.

Mr Dawson—Which is probably not shared.

Mr MARTYN EVANS—Which is not shared, but some of which is available for purchase—from the state government, for example. Topographical data is a case in point that we have talked about with other witnesses. Have you ever tried to purchase any of that, had difficulty purchasing it or found it prohibitively expensive to purchase?

Mr Dawson—In the board process we have certainly had to purchase information.

Mr MARTYN EVANS—And it has not been a particular problem?

Mr Dawson—You have to weigh up the price against what you think the value of the information is.

Mr MARTYN EVANS—So it is expensive when you buy it—that is an issue?

Mr Dawson—Yes, it is an issue. It would be nice if it were otherwise. Privately funded and gathered information I suppose should be sold, but if information is being gathered with assistance from government it should be made available to all and sundry. There should not be a price on it. It should be public information.

Mr MARTYN EVANS—Fair enough. Thank you. As for the activities of the board itself locally, do you employ extension officers who go out on the farms and talk to farmers about salinity and catchment management issues?

Mr Dawson—Yes. We are about to start writing up the investment strategies because, as you know, we have finally had an announcement on the blueprint funding. How it will work—certainly, in our catchment—is that the board will employ, or contract out the employment of, a range of frontline people whose role will be to negotiate with land-holders on a whole range of blueprint on-ground works, and salinity is one of them. They will need to have a broad understanding of all those land degradation issues, but they will be supported by technical salinity officers. The board is driving that process.

Mr MARTYN EVANS—Right. So you would possibly see them evolving into a bit of a focal point for building a relationship? It seems very important—and I can understand that—that farmers in particular can establish a long-term relationship of trust with someone that they can deal with on an ongoing basis and talk about these kinds of issues. Earlier Syd Clarke, our previous witness, highlighted the importance of being able to have a long-term relationship with someone you can relate to.

Mr Dawson—That is exactly what we are striving for. In fact, we are trying to re-employ a lot of the old Landcare coordinator type people under this new program. They have lived in the community and have a standing within the community, and they will continue to live in that community and have a key role in delivering the blueprints.

Mr MARTYN EVANS—When the board has its new ongoing role—from the start of 2004, I take it—do you think it will be possible to relate the detailed data that hopefully will start to build up on a property-by-property basis down to the individual farm level? Obviously that will amount to a substantial amount of data in the future. Will the board themselves play a role in maintaining data sets on an individual property-by-property basis so that the officers who go out to the farm will be able to take with them either a laptop or a coloured printed map that will cover the individual farm rather than half the state?

Mr Dawson—I think we are 10 steps in front of you. All our people have been equipped with laptops and have data sets, certainly down to a sub-catchment scale, so that they have an indication of what they should be looking for there. We are still having a debate within the board as to privacy and confidentiality as far as land-holder information, but certainly the intention of the board is that we would like to track where we are investing in those targeted works. Spatially, we would like to track what is happening and where.

Mr MARTYN EVANS—But if the property holder consented to work with the board and with the advisory officer, the extension officer, that you were employing so that the privacy issue went away, would it be possible and is it your intention to have that property-by-property data set?

Mr Dawson—We intend to set up a database that meets our needs and that will allow us to track spatially where the works are going and what the issues are. But, again, Syd made the point that, rather than a shotgun approach, the blueprints are really quite specific and targeted. We are trying to get the best bang for the buck. Although a land-holder may think we should be investing in something on his property to address an issue, if we do not see it as a priority area he may not get any assistance.

Mr MARTYN EVANS—But in terms of advising him about his property, someone has to maintain the data.

Mr Dawson—Yes. All our implementation officers—and that is what we are calling them—have received training, and some of them are quite skilled in developing property plans. That is probably what we are hanging this whole process on: the implementation officers working with land-holders, developing property plans which look at all those natural resource issues and coming up with a management plan to address them.

Ms CORCORAN—Are you aware of CANRI, the department's web site?

Mr Dawson—Yes.

Ms CORCORAN—Do you think landowners or land users are generally aware of it?

Mr Dawson—No.

Ms CORCORAN—Because they do not want to know, because they are not web site users anyway or because the site is well hidden?

Mr Dawson—From a land-holder's perspective, the data sets I have seen there are generally quite coarse—1:100,000 at best, maybe 1:250,000. For a land-holder, the coarseness of mapping at that scale is probably quite meaningless.

Ms CORCORAN—That was not quite what I was asking. I understand that, once you get in, the information is not particularly usable because it is not user-friendly language and so on. Does the land user know about it and decide not to use it because it is not useful, or does the land user just not know it is there? Is the Internet a useful way of disseminating information?

Mr Dawson—There are three questions there.

Ms CORCORAN—Yes, sorry.

Mr Dawson—In answer to whether land-holders know about it, I suggest very few do. Our department did a survey of the various boards across the state and a lot of them were unaware of it. The knowledge of where to go is sometimes in question. The usefulness of the information at a broad level—a sub-catchment level—is very good. On a property level it tends to fall apart, and from a land-holder's perspective, there is probably not a lot of benefit in him looking for it. As far as land-holders using the Internet, it is increasing—I would not like to guess at the percentage of land-holders in the Murray who would be skilled at using the Internet and accessing it often. I would be very surprised if it were more than 40 per cent.

Ms CORCORAN—Do you think that scientists are aware of landowners' or farmers' needs?

Mr Dawson—Some are. 'Scientists' is a pretty broad brush. We have some good scientists working in our catchment who are right on the front line and dealing with land-holder issues all the time. Certainly the people who get out into the field have to be aware. If they are talking and working with the communities, they have to be aware. As for the people who are sitting in their ivory towers back in Canberra or Sydney or wherever, I do not know.

CHAIR—Could I just go back to the questions Peter Lindsay asked with respect to data. You agreed with his comment about the cost of getting hold of the data. As a catchment management board, what are you using as base topographical data for all you do—250,000, 100,000 or 50,000? What are you currently working on?

Mr Dawson—Half our catchment is covered by 1:25,000 and the rest by 1:50,000.

CHAIR—So a lot of it is 1:25,000. That data, for instance, would have come from the Land Information Centre. Did the board have to pay for that data?

Mr Dawson—No. The relationship between the board and the department is quite close. The board is a board—they request studies, surveys and some science. It has been up to the department to provide that.

CHAIR—So anything you are getting from the actual state departments is not a cost to the board as such?

Mr Dawson—Not a direct cost to the board. How it has worked up until now is that the board has not had a budget of its own—it was a group of people whose brief was to develop this catchment plan. They have used the department and other agencies wherever they can to get that information and make those decisions at a board level.

CHAIR—So under the new regime it will be a lot better.

Mr Dawson—It will be different.

CHAIR—Under the catchment management authority there is cold hard cash going into those so that there will be a budget.

Mr Dawson—Money will change hands.

CHAIR—What other data would you want to access on an ongoing basis that will be at a cost to the board?

Mr Dawson—There are all sorts of things. There is water quality information, there is an imperative that we monitor progress towards all of our targets—a whole range of things need to be put in place.

CHAIR—Sorry for interrupting. What you are talking about is the cost of acquisition and getting hold of that or manipulating it, not necessarily acquiring it if it already exists. If that sort of data already exists somewhere within government—

Mr Dawson—No, this data would have to be collected.

CHAIR—So here we are talking about the cost of collection, not simply buying the data. I just wanted to clarify that. I see that of the various projects that are under way under the national action plan, two are in your catchment. Is the Lower Murray part of it as well?

Mr Dawson—No, that is a different board area, so I am not familiar with that one.

CHAIR—So there are two projects there, totalling somewhere around \$480,000, which I think is Commonwealth funding.

Mr Dawson—Yes.

CHAIR—Those ones are: targeted implementation of the *Murray Catchment Blueprint* within the south-west slopes management unit; and implementation of the Darling anabranch management plan, including improvements to Packers Crossing regulator for water quality environment flows in the Darling anabranch.

Mr Dawson—I am not familiar with that one—that is in the Lower Murray-Darling one. I am certainly familiar with the first one.

CHAIR—That was one of the projects within your blueprint that fitted within the NAP criteria.

Mr Dawson—That is a great example. It might have been Mr Evans who asked the question about working with land-holders: how do we give them some information? That project is specifically talking about drilling down to a property level and providing the science to the land-holder so that informed decisions can be made.

CHAIR—It is good to understand that that is how some of the funding is being used for these projects.

Mr Dawson—That one is a good project.

CHAIR—That is a direct example of taking the science right to—

Mr Dawson—To the property.

CHAIR—the land-holder. And the science that is being taken has more or less had the scrutiny of the catchment management board?

Mr Dawson—It has gone the whole loop: it has been developed through the department and the board and it has gone to five rounds of community consultation over the three years. I think it is fairly well accepted by the community. It is probably the best we have to go with at the moment.

CHAIR—Thank you very much for your evidence this morning and for your submission.

Mr Dawson—It was a pleasure. I meant to give my apologies for two or three other board members who would have loved to be here, but because of other commitments they could not make it.

[10.40 a.m.]

SHORT, Mr Bryan Francis, Director, Asset Management, Wagga Wagga City Council

CHAIR—Welcome. The committee has before it submission No. 5 from Wagga Wagga City Council which has been authorised for publication and is therefore on the public record. Along with your submission, exhibits No. 6 and No. 7, which relate to the one stop shop for managing urban salinity and multiregional projects, have been accepted as evidence. I invite you to make an opening statement before we proceed to questions.

Mr Short—In the early 1990s a few problems were becoming evident to the Wagga Wagga City Council for which we were unable to pinpoint the reasons. Roads were breaking up earlier than they should have, the surfaces of sporting grounds were deteriorating, vegetation was dying and there was damage to infrastructure. This damage came in various forms, one of the most concerning being damage to residences. We were seeing continual dampness underneath houses, which we thought was just a lack of ventilation, so we encouraged people to put more ventilation in. But, as time went by, it got worse than that. We started to see brickwork deteriorating. Brick surfaces were going powdery and flaky and the brickwork was disappearing. In our tour of inspection later today we can hopefully show you some examples of that. Inside houses, we are starting to see dampness in the walls and plaster falling off walls. People are finding that they have to spend \$10,000 to \$20,000 on repair work for some of these houses. A lot of these are elderly people who do not really have that sort of money available to them.

I suppose it all came to a head when we got a call from the Wagga showground, which was having trouble with its arena. They had just built a new trotting track and they were trying to re-establish the arena. They had sown it about three times but it would not take; they could not get the grass to grow. So an inspection was done, with the Department of Land and Water Conservation and council representatives, to see if we could give them some assistance. The DLWC, with its earlier experience of salinity in rural areas, said that this had all the hallmarks of salinity. So we dug a hole with a backhoe. We only went down about two feet, and we left the hole for a period of time. Within about half an hour there was water in the hole up to within 100 or 200 millimetres from the surface. Basically what we had was a watertable under the city that was very close to the surface. As Syd Clarke was saying, all of a sudden the lights went on and we could see what the problem was: we had a very shallow watertable under the city.

We tried to do some investigation to find other places that had similar problems, but no-one came forward. So we were in a bit of a quandary as to what we should do. Fortunately, the Department of Land and Water Conservation, as it was then called, was very helpful to us. They had not seen it in any other towns before, but they saw it as an opportunity. Their scientific and professional background told them that it was quite possible to have salinity not only in rural areas but in urban areas as well.

So council and DLWC embarked on a partnership for about a four-year investigation period because at that stage when we tried to elicit some information about what had been happening under cities, in terms of the movement of our watertable, there was no information about it. All the old wells had been filled in, so there were no monitoring points in the city. We did get advice

from adjoining rural areas that watertables in those areas had been rising somewhere between 0.3 and 0.6 metres per annum over the last 20 years. We had received advice from the CSIRO that the amount of water going into the ground water table under pristine conditions might have been in the order of 0.1 millimetres per annum per year. Under farming conditions it is more like one millimetre per annum per year, but under urban development it is more like 10 millimetres of water getting into the watertable per year. When that gets in and fills up the voids in the soil, it has more than a 10-millimetre increase per annum. We were finding in adjacent areas that it was rising in the order of 0.3 metres per annum.

We then went through a series of investigations, research and trials—doing little trials then scaling those up to be bigger trials—and over that four-year period we developed a wealth of knowledge. We also did a natural resource management plan, which is a bit like a soil and water management plan for the urban area, where we were looking at the areas that we needed to tackle in our development control process.

At the end of the day, we came up with a program with four fronts. One was education—we needed to improve the education of our citizens about what was going on underneath the surface. The second part of the program was that we realised that we needed to do some revegetation wherever we could in the city. Thirdly, we also realised that we needed to reduce the amount of urban type water inputs going into the soil. They were varied. It was common practice to get rid of your roof water through what was called a rubble pit in your backyard. Your downpipes led to this pit in the backyard which was roughly two metres by two metres and maybe a metre deep, filled with builders rubble, and your stormwater discharged into that and then soaked away. Up till the sixties and seventies that was seen as good practice but, in hindsight, it was directly injecting water into the ground water table.

There were also water supply systems which were leaking. I saw some recent publicity in Sydney where they were saying that they are losing in the order of 10 per cent of the reticulated water. They do not know where it goes and the majority is leaking away. All water supply systems leak, no matter how good they are. Our local water supply authority, which is not run by council, advised us that their system was pretty good, but even work done by the old department of public works indicated that somewhere between five and 30 per cent is typical leakage from a water supply system. So you have all these extra urban type inputs going into the ground water table, which is why you have substantially higher movements in the ground water table under urban areas than you might under rural areas. The fourth part of the program was that we put in a bore field of 10 bores where we needed an immediate response to lower the watertable under these areas. We drew water out of those bores to lower the watertable.

Council spent four years doing the investigation phase. It then moved into a phase of construction projects and remediation work. Council allocated \$3 million of its own. That drew in the order of \$2 million from various government sources, both state and federal, but essentially from the NHT program, to allow us to implement a series of programs. We felt, after that four-year investigation period and six years of carrying out these works and still working on them, that we were ideally situated to be a demonstration site for people to manage urban salinity. Hence we put forward a proposal to government, which is one of the attachments to our submission, on the one stop shop for managing urban salinity.

We have been trying to sell that proposal to government at various levels for about two years. To date we have had very little positive encouragement. We see it as an ideal way of spreading the message about how you turn science into practical solutions for managing urban salinity. My main concern is probably about duplication of effort. If other people are not aware that we are in a position to assist them with these activities, they will be going out and doing exactly the same work that we have already done. We could save them a lot of heartache and effort if we were seen as the place to come and see what you can do for urban salinity. We work with a variety of partners—I mentioned the Department of Land and Water Conservation, but there is also the CSIRO, a number of consultants and Charles Sturt University—to assist us in formulating these programs. That is why, when the council saw that this inquiry was taking place, we decided that we should bring this to the committee's attention. That is basically where we are.

CHAIR—Thank you, Mr Short. We appreciate that background. What has happened to the watertable? Has it stopped rising or is it starting to fall?

Mr Short—We have run into two years of drought, so that has had some influence on it. In the area where we have got the borefield, which we ran for about 18 months, we lowered the watertable from virtually at the surface to between seven and 10 metres—varying across the topography. We turned the bores off and the watertable has subsequently risen back up to about three metres from the surface. We are just about to turn them back on again.

CHAIR—Where does the water you pull out of the borefields go?

Mr Short—We have a special licence—because it was a trial project—from the Department of Land and Water Conservation to discharge it to the stormwater system and then it gets into the Murrumbidgee River. What we are doing is drawing the water from 50 metres below the surface where the salinity content is fairly mild—it is in the order of between 1,000 and 1,500 microsiemens. In some parts of South Australia they are still using that quality of water for irrigation. As you rise through the soil profile, and particularly near the surface where you have had continuous evaporation from the surface and the salt is left in the soil, the water becomes much more saline. In the case I mentioned up at the showground, the salinity of that water was in the order of 15,000 microsiemens, which is about a third of the level of sea water.

CHAIR—In your document on the one stop shop, are you aware of the documents that the state government have produced on urban salinity: *Site investigations for urban salinity*, *Building in a saline environment*, *Roads and salinity*, *Broad scale resources for urban salinity assessment* et cetera. Maybe they gazumped you, did they?

Mr Short—The manager of that department is an ex-council employee, and a lot of the material that is in there is photos of Wagga and material that was in some of our earlier documents. You can see that we have produced documents entitled *Building in a saline environment* and *Water wise and salt tolerant plants*. What is happening is that a lot of that information is being put into those documents now being produced by the state government and being disseminated. We are quite happy to see that happen. We put all our stuff on our web site so people can access it. What we are saying that, yes, the literature is there and is starting to become more readily available, but if you want to see that advice being put into practice come and see it at Wagga Wagga.

CHAIR—With regard to the document on the one stop shop, you said that you have not been able to get governments interested. How do you see that being used?

Mr Short—There are a couple of things I should raise. Right since the time that we discovered that we had salinity here, we have had difficulty convincing both bureaucrats and politicians that urban salinity is a legitimate player in the salinity problem. Most people tend to see it as a rural problem and, on that basis, it does not always get ranked to the priority that we would expect it to be. In the draft version of the blueprint that was being prepared for Wagga, out of the 30-odd recommendations the only one that addressed urban salinity was No. 30. We subsequently made representations to that effect. Now it is midfield in the priorities but it is still not seen as a high priority.

CHAIR—When you say urban salinity was priority No. 30 and now it is midfield, is that part of the blueprint for the Murrumbidgee catchment?

Mr Short—Yes, the Murrumbidgee catchment.

CHAIR—I was going to ask whether there was the possibility of assistance under the national action plan, but the national action plan will be based on the priorities that are put forward by the catchment management authorities.

Mr Short—Typically the targets in the blueprint address the water quality. We sought to get extra targets put in there about protection of infrastructure and we did not get a very positive response with regard to that either. They are looking at the salinity levels and the turbidity of the water. The targets tend to be water quality based rather than protecting infrastructure in the catchment.

Ms CORCORAN—How much luck are you having in transferring this information to the residents of Wagga Wagga? Do people generally accept there is a problem?

Mr Short—Yes. Up until two years ago we had an NHT program—the NHT program still exists but it is for small projects and it tends to be for community groups, rather than for the likes of councils, to apply for—to address salinity that was in the order of \$1 million per annum. That project always included an education component. For the last seven or eight years, council have had an education person on staff who has been getting out there and promulgating much of the research work that has been done, being active in the urban landcare group, being involved with exercises for schoolchildren, preparing lesson packages for teachers, talking at public meetings whenever we were invited and sometimes pushing us forward to give people the opportunity to talk to us at various public meetings that touch on natural resources. So we are doing our best to get out there to sell this message to the community.

Ms CORCORAN—I gather some of the problems are simply caused by people watering their gardens?

Mr Short—That is right. As part of the revegetation project, we have gone out there and encouraged people to use low water use plants, mulches and creepers rather than lawns.

Ms CORCORAN—Is that starting to bite?

Mr Short—We have a couple of demonstration sites where we have done nature strips for people and have said, ‘This is what we think you should be doing.’ That has not been broadly taken up by the community, but we are getting assistance from the water authority which is bringing in mild water restrictions to encourage people to use water timers so they are not watering day in, day out. Slowly we are making an impression, but not at the rate that we would like to.

Ms CORCORAN—We heard evidence from people yesterday about the extension officers having limited acceptance with farmers—they are seen as people who do not really know what is going on; the farmers know the land better and all that sort of stuff. You have a number of staff whom you could almost describe as urban extension officers. How are they accepted in Wagga Wagga?

Mr Short—Very well. Any time that we have gone to the media, they have always run anything that we have wanted to put in and have always supported any programs that we have wanted to run. Through the media we are getting good support. In terms of acceptance within the community, we have a good relationship with the community. Early in the piece I think people were fearful of Wagga being known as a town that had salinity problems, but as time has gone by they have seen the programs we have put in place and the fact that people are coming here for leading-edge information to tackle salinity. I think the public perception now is that, although we do have a salinity problem, the council are making an effort to manage it. Whenever any community surveys are done and people are asked where council should be spending their money, salinity is always in the first three or four responses. So there is an awareness that we have a problem and an acceptance that we need to spend money on it to fix it up.

Ms CORCORAN—Is salinity a criterion or an issue when people come to you for building permits and things like that?

Mr Short—Yes. We have prepared a map of Wagga and delineated the worst affected areas. We advise people of that on a section 149 certificate. Quite often, they will then come into the council and start asking more detailed questions, and we are happy to supply them with the information we have. When we started putting piezometers around the city initially we did not have any information on what the ground watertable was doing. We now have over 100 piezometers, and we monitor those on a regular basis and release an annual urban salinity report so people can see what is happening in respect of watertable movement under the city. There is plenty of information there for them. Also, the local building industry are aware of it. They know how to advise people on any building work they want to do in the saline environment, and they know what to look for when they are doing building inspections.

Mr MARTYN EVANS—You say in your submission that the impact on infrastructure is very significant. You cite the example of roads that only last one-third to one-half of the usual length of time. You comment that you can safeguard to some extent against salinity but that means the cost of the road may double, so you are faced with either doubling the cost of the road or halving its prospective life if you do not do that. Are you aware of any ongoing research into road construction techniques that any agency or scientific research group—such as CSIRO, one of the universities or the department—is conducting that would seek to improve those ratios?

Mr Short—The University of Western Australia has done some research on it. They have put out a useful publication. The Australian Road Research Board has in recent times started to take an interest in it and has offered to do a research project on roads in saline areas.

Mr MARTYN EVANS—So there is very little at the moment? That is a fairly small amount, and you say the Australian Road Research Board is just starting work on that.

Mr Short—That is right.

Mr MARTYN EVANS—Given the cost and length of roads in Australia and the potential area affected by salt, that is a pretty serious state of affairs with respect to the science of road construction, isn't it?

Mr Short—It is. The economic studies that we have had done of Wagga have indicated that, if we do not do anything about salinity, the damage to infrastructure will be in the order of \$180 million over 30 years.

Mr MARTYN EVANS—And that is just in Wagga?

Mr Short—That is just in the Wagga urban area. Some of the literature I have seen indicates that the costs of urban salinity will far outweigh the costs of rural salinity.

Mr MARTYN EVANS—Science has already delivered, in its limited way, to dryland salinity and irrigation issues in the rural community. Science has obviously not solved the problem, but we have seen a significant impact in the rural community from scientific application. We heard from Syd this morning that the science is going ahead in leaps and bounds, as far as he is concerned. We need to see some similar application of that in the urban area—especially given the very clear-cut way in which we could apply that to road construction, for example. If science were applied directly on a research basis to road construction material, you might see some dramatic cost-benefit improvement in relation to the need to either halve the length of time roads last or double their cost.

Mr Short—I agree with you. The scientific effort in regard to urban salinity has not been great. A fair bit has happened locally, but it was probably driven by council and the fact that we were getting regular NHT grants, which we have not been getting for the last two years. We have been told to sit on our hands while we do all this planning and prepare our blueprints before we start releasing any of the national action plan money, which has been fairly frustrating. So council has been plodding along just trying to keep its own programs ticking over waiting for some of this money to flow, but now we have concerns that urban salinity is not going to be a high priority. It is going to be overlooked, because the targets are not saying that damage to infrastructure is a target they want to address.

Mr MARTYN EVANS—How do you get your science information? How do you access science from the point of view of piezoelectric monitoring? How did you get the information to use that? How do you monitor it, plot it, map it? Who do you use for general science advice? Do you go to engineering consultants? How do you monitor the field on a regular basis to see that you are up-to-date? Do you call in consultants or use your own skills?

Mr Short—A lot of it is in-house. We have a number of staff members—or we have had over the last five years—who have come from natural resource backgrounds, engineering backgrounds or the social sciences for assessing the impact on the community. When we get into an area we do not feel confident in, we go out and utilise the likes of CSIRO. We have used their hydrogeologists quite widely and also the hydrogeologists within the Department of Land and Water Conservation. It is getting harder to access those resources. Whereas they used to be able to tell us what programs they would fund this work out of, they are now saying to us, ‘Can you fund this work?’ We do not have any funds flowing from the government at this stage, so we are saying no. We had discussions with the Bureau of Resource Sciences in the federal government department about doing airborne geophysical studies of this area. They said, ‘That’ll cost \$70,000,’ but we just did not have the money to get that work done.

Mr MARTYN EVANS—Do you turn to the Internet?

Mr Short—Yes. We are broad users of the Internet. About three or four years ago when I was seeking information on urban salinity, the only site it referred us to was our own site. There did not seem to be a lot of other people out there that were addressing urban salinity.

Mr MARTYN EVANS—With your 100 watertable monitoring of the piezoelectric sites, do you have someone in house who monitors those, and then collate the data yourselves?

Mr Short—Yes, that is right. We have an environmental monitoring group that looks after a lot of other things in terms of our waste disposal sites and sewerage sites, and this is just another bit of environmental monitoring that they do. As I was saying, they produce an annual report—that is, our urban salinity annual status report. Copies of that go into the library and it is also accessible via the Internet.

Mr LINDSAY—The borefield: what was the cost of running the pumping operation?

Mr Short—The installation process—the drilling and the bores—cost us about \$100,000. The insulation of the bores was about that much again. The investigation to find out where the bores should be located was probably about \$100,000. So about \$300,000-plus was spent in capital costs putting it in there. The running costs are probably about \$10,000 a year.

Mr LINDSAY—My reaction to that is: I do not believe it—I mean the \$10,000. Is it electrically run?

Mr Short—Yes.

Mr LINDSAY—What kind of volume are you pumping out?

Mr Short—They are very low volumes. They range from about half a litre per second up to about five litres per second.

Mr LINDSAY—Then I take it back. And that is a cost borne by the council?

Mr Short—That is right.

Mr LINDSAY—In relation to your one stop shop document and your not being able to get it on the national agenda, I was talking to Mr Clarke about this earlier—about getting information on the ground back into the scientific system. I think I detected that you were expressing—certainly, it is written in your submission—some unhappiness that you could not get the thing up as a project. Do you think it is important for the nation that on-the-ground feedback goes back into the science sector?

Mr Short—I do, particularly with regard to urban salinity. The last paper I saw on the extent of urban salinity said that there was going to be in the order of 30 urban areas in New South Wales and a similar number in Victoria. The Western Australian government has a rural towns program; there are 30-odd towns over there also affected by high watertables. We liaise with the Western Australians reasonably well, so there is a bit of cross-pollination of ideas there. We have visitors from other towns here on a regular basis who realise that they have urban salinity problems so they come and look at us. But most of them do not have the capital funds to start putting in the likes of bore fields and running some of these extensive programs that we have, so they must be struggling, with the problem just getting worse and not really being addressed.

Mr LINDSAY—Do you have a feeling—because you cannot get this project up formally—that perhaps the science community devalues what you are doing?

Mr Short—I think the science community go where the money is because all their work is based on securing grant funding to finance themselves, and at the moment there is not a lot of funding going towards urban salinity.

Mr LINDSAY—We heard a bit of evidence about that yesterday. It translated into the comment that academics could be guilty of, first of all, securing their own funding base before doing what really should be national priorities in research. It was also expressed a different way—that governments or ministers wanted quick fixes to things and just wanted academics to research certain things that are fairly well known and not get on with frontier type science. Do you detect that to be the case? Is that your evidence to the committee?

Mr Short—I would be sympathetic to that point of view, yes.

Mr LINDSAY—That is a very good council response! Let us talk about the science of salinity, which my colleague asked you about earlier. You have said, ‘It doesn’t matter how good the science is; if it can’t be translated and understood by residents, what was the worth of it?’ Wagga is a high-profile community with an urban salinity problem. If I talked to a resident there now, do you think that they would know and understand what the problem is and what can be done about it? Or have you not yet effectively got to your ratepayers?

Mr Short—We have done community surveys periodically through the Charles Sturt University and the communications students out there. In the early days, not many people knew about it, but the more recent surveys show that their knowledge that Wagga has a salinity problem, as well as a bit of understanding of what salinity is, is up around 70 per cent. We thought that was a fairly good result.

Mr LINDSAY—That is okay. Has the council developed salinity control measures in its DCPs? I assume you have DCPs.

Mr Short—Yes, we have DCPs, and a number of conditions were put in there due to our research on this in terms of rural residential developments and small acre holdings. We are now talking about the tree densities that are required on different slopes with regard to urban subdivisions. Urban subdivisions have rear-of-block drainage now rather than rubble pits. Rubble pits are outlawed in the city. If people are building in these areas that have been identified as high saline areas, it is not in the development control plan, but we strongly advise them to follow the recommendations in these brochures that were produced on building in a saline environment. The information that is coming out of this investigation research side of things is being fed into the development control plan for the city.

Mr LINDSAY—Does the council consider that it has a duty of care or a legal responsibility to warn people that they are building in saline environments?

Mr Short—We do that on the section 149 certificates and, if development applications come in and they are in a saline area, they are warned that those areas are affected by high watertables.

Mr LINDSAY—Have you had any objection from the development community in relation to conditions that you are putting on new developments?

Mr Short—No, we do not anymore. When this information first became available, some of the lending authorities—particularly the mortgage guarantors, who were lending that last 10 per cent of the loan—started to knock back applications from Wagga. It was not until they became aware of the programs that the council had in place that they relaxed those conditions where they were not supplying funding to the Wagga area. The development community know that, if the council is not out there making people aware of these things, they will not be able to turn over development properties, because the development lending authorities will not participate in the process.

Mr LINDSAY—Thinking about the wider local government area, is urban salinity discussed at local government conferences in New South Wales, or is still not a front-of-mind issue?

Mr Short—It runs a bit hot and cold. With the drought that we have had in the last two years, the rising watertables have not been as visible as it had been prior to that. But, yes, the council has spoken several times at conferences organised by local government authorities in regard to urban salinity.

Mr LINDSAY—Finally—and this might be too difficult to answer, because various councils do various things—do you think that the average ratepayer in another council is as well aware of urban salinity issues as people in Wagga would be?

Mr Short—No, they certainly would not be, because those councils would not have a natural resource education officer out there telling the community about these issues.

CHAIR—Can I come back to some questions that Mr Evans was asking with respect to roads, engineering and the cost. Have you looked at any overseas experiences with respect to roads in a saline environment? The thought comes to mind that there must be other parts of the world that tend to be in a natural saline environment, and there may be some lessons to learn there.

Mr Short—When I went searching for that sort of information I was looking at Egypt, Venice and those sorts of places, but I could not unearth anything specifically about building roads in those environments. The RTA does have some guidelines for building in areas of high watertables, and there are techniques that you can use, but they are expensive. They are typically twice the cost of building a road in a conventional area.

CHAIR—What is the major part of the doubling of the cost to build where you have got salinity problems?

Mr Short—You are trying to waterproof the pavement, so you may wrap that in some sort of impermeable membrane. You will probably have to have a deeper pavement—instead of having a 300-millimetre pavement you may have to have a 500 millimetre thick pavement. What you tend to do is wrap it up like a sausage to try to protect it from the water penetrating the pavement.

CHAIR—I can see why it doubles the cost very quickly. The other point I want to ask about is on the national action plan on salinity. Would you recommend that there ought to be an aspect of that quite specifically targeted at urban salinity?

Mr Short—Yes, certainly.

CHAIR—What is the relationship between the Wagga Wagga City Council, Murrumbidgee Catchment Management Board and, potentially, the catchment management authority? As I understand it, the Wagga Wagga council region is quite large—it is much broader than just the town, isn't it?

Mr Short—That is right.

CHAIR—So a lot of the area that the council is responsible for takes up a fair part of the catchment, presumably.

Mr Short—The Wagga local government area is roughly 100 kilometres long and 50 kilometres wide as a result of the merger of two shire councils back in the early 1980s. On our relationship with the Murrumbidgee Catchment Management Board, the board consists of about 18 members, of which three are local government members. Council did nominate two people to stand on that committee and neither of them was successful, so Wagga does not have direct representation on that. It relies on the local government representative, which is from the top end of the catchment, the mid catchment and the bottom end of the catchment. I suppose there are probably 20-plus local government organisations within the Murrumbidgee Catchment Management Board.

CHAIR—Wagga Wagga would be by far and away the biggest population-wise, wouldn't it?

Mr Short—It would be. Canberra is in that catchment as well—they have a representative—but, in terms of cities within New South Wales itself, Wagga would be the largest. It is the largest inland city in New South Wales. So, no, we do not have representation directly and we have to rely on the local government representatives, and they are pretty busy people and do not have a lot of time to get around and talk to all the other councils. At an administrative level, we have a

fairly good relationship with the board. At the moment they are struggling to put their budget program together. They were just advised in the last week of the funding that was going to come to them—in the order of \$13 million for this financial year. We are yet to see where those funds will be expended.

CHAIR—But you said earlier that, within the priorities, the urban salinity issue has now got off the bottom of the priority list. Did you say it was mid-range?

Mr Short—Yes.

CHAIR—So there may be some greater possibilities within that funding to get some assistance.

Mr Short—We would hope so, but it remains to be seen.

CHAIR—I think we have covered the additional things I wanted to cover. Having gone through the questions, was there anything else from your overheads that you feel we ought to know?

Mr Short—No, I do not think so. I have waved around the things that are appropriate. We are going on an inspection later on, so I will be able to show you some of the stuff in the field. A lot of this is photographs of that.

CHAIR—Thank you very much for your evidence this morning. We will see you out in the field very shortly.

Resolved (on motion by **Mr Martyn Evans**):

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

Committee adjourned at 11.24 a.m.