REPORT OF PROCEEDINGS BEFORE

STANDING COMMITTEE ON STATE DEVELOPMENT

INQUIRY INTO THE ADEQUACY OF WATER STORAGES IN NEW SOUTH WALES

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At Wagga Wagga on Thursday 1 November 2012

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The Committee met at 9.00 a.m.

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PRESENT

The Hon. R. H. Colless (Chair)

The Hon. P. Green
The Hon. Dr P. R. Phelps
The Hon. M. S. Veitch (Deputy Chair)
The Hon. Steve Whan

CHAIR: Welcome everyone to the second hearing of the Standing Committee on State Development inquiry into the adequacy of water storages in New South Wales. I acknowledge the Wiradjuri people, who are the traditional custodians of this land, and pay respects to the elders past and president of the Wiradjuri people and extend that respect to others who may be present. The inquiry's terms of reference require the Committee to inquiry into and report on a range of issues, including the capacity of existing water storages and models for determining water requirements for agricultural, urban, industrial and environmental needs. The inquiry also will examine proposals for the construction and/or augmentation of water storages in New South Wales. Today we will be hearing from representatives from Water for Rivers and a number of local government organisations. Before we commence I shall make some comments about certain aspects of the hearing.

Committee hearings are not intended to provide a forum for people to make adverse reflections about specific individuals. The protection afforded to Committee witnesses under parliamentary privilege should not be abused during these hearings. I therefore request that witnesses avoid the mention of individuals unless it is essential to address the terms of reference. The Committee previously resolved to authorise the media to broadcast sound and video excerpts from the public proceedings. Copies of the guidelines governing broadcast of the proceedings are available from the table by the door. In accordance with these guidelines, a member of the Committee and witnesses may be filmed or recorded; however, people in the public gallery should not be the primary focus of any filming or photographs. In reporting the proceedings of this Committee the media must take responsibility for what they publish or what interpretation they place on anything said before the Committee.

Witnesses, members and their staff are advised that any messages should be delivered through the Committee clerks. Under the standing orders of the Legislative Council any documents presented to the Committee that have not yet been tabled in Parliament may not, except with the permission of the Committee, be disclosed or published by any member of such Committee or by any other person. Finally, I ask that everybody turn off their mobile phones for the duration of the hearing as they interfere with Hansard's recording equipment. I welcome our first witnesses, Councillor Trina Thomson and Mr Ken Fletcher from Tumut Shire Council.

KENNETH JOHN FLETCHER, Environmental Waste Officer, Tumut Shire Council, and

TRINA THOMSON, Mayor, Tumut Shire Council, sworn and examined:

CHAIR: If at any stage you consider any evidence you may wish to give or documents you may wish to table before the Committee should be heard or seen only by the Committee, please indicate that fact and we will consider your request. Councillor Thomson, would you like to make a short opening statement?

Ms THOMSON: The first thing I want to do is thank the Committee and welcome it to our region. It is incredibly vital that we have been given this opportunity to present. I do not intend to address each of the individual points as we go through, but one point I make is that I believe the Tumut Shire Council and its section of the river deserves to have the same level of consideration for what the water is actually being harvested, that is, for our downstream users. Our river used to start under where Blowering Dam is now. We appreciate and respect the fact that the dam is there as a water storage. It does not have flood mitigation associated with it. We believe that what needs to happen is the same as with transport: You need to have the consideration for the first mile just as you have for the last mile. That is the point I would really like to push today.

We have strong needs and the river plays an integral part in the wellbeing, health and economy of our community. At the moment our river is really being denigrated and is struggling to survive. Trout fishing is really important to us, and fishing in general, but at the moment, even though trout are not native, native fish struggle to survive because we have a river that is turned upside down. We have fast and cold water high flows in summer and then we have low and warm in winter, so native fish struggle to survive, as does a lot of the natural habitat. From our perspective, some of the major concerns are the draw-down rates. Other issues are management.

I was on the Tumut River Advisory Committee [TRAC], which has had two down-river expeditions to develop the management plan and memorandum of understanding. Unfortunately, we have never had the funding to implement those works. We identify and continually raise the issues and concerns, but there does not seem to be the ability to fund the works required. We are asking for the same level of consideration to be given for the beginning of our dam as towards what the water storage is all about, that is, providing essential water for the irrigators.

CHAIR: Mr Fletcher, would you like to add to that?

Mr FLETCHER: It has been said.

The Hon. STEVE WHAN: In your submission you talk about needing $1.8 million funding per year for mitigation work and later state that the NSW Office of Water had lodged submissions to the Independent Pricing and Regulatory Tribunal [IPART] to try to raise those funds. Are charges your only source of funds for this work? Are there other sources?

Ms THOMSON: No. Irrigators used to contribute to any works being undertaken. The irrigators believe they already are paying that money through their bulk water charges. At the moment it is funded 75 per cent through government and 25 per cent through Snowy Hydro. This is where it becomes very difficult because that $1.8 million is what is identified, but that is not actually what is being spent. The funds are not available to undertake the work of the plans that have been developed. In fact, it actually is compounding. But apart from the work that is required, what we are talking about is trying to reduce the impact on the river. Part of that directly relates to the draw-down flows, which does not require funding, just management.

The Hon. STEVE WHAN: You want the river level looked at rather than the water volume?

Ms THOMSON: Yes.

The Hon. STEVE WHAN: What impact does that have on the capacity to deliver irrigation water? Have you seen an assessment of that?

Ms THOMSON: This inquiry is about the adequacy of storage. A number of years ago there was talk about further storage systems along the river as it went, instead of having it stored at Blowering Dam and then

just putting it down there whenever it was needed. The reality is not about the volume of water being put out; it is about how that river level impacts on the river banks. That is where the damage is being created. It is about whether or not it can be managed to be released more appropriately instead of having, I suppose, that dramatic increase. I think we have included in the submission a draw-down rate for what has been happening, and that is just the last few days. It demonstrates very clearly that it goes from very high flows to very low flows. That needs to be managed much better. Whether that is through storage systems further along the river or up to irrigators to have some form of storage areas within their own areas, I do not have the technical ability to come up with that. I just know that for us those rises and falls are a very big difference between the actual volume of water putting out compared to the river levels.

The Hon. STEVE WHAN: I understand the damage to the river banks. You make the point about flood mitigation in the dam?

Ms THOMSON: Yes.

The Hon. STEVE WHAN: Requiring airspace in the dam obviously would impact on the capacity to supply for longer periods in drought. Have you considered that?

Ms THOMSON: We have gone from probably the absolute extremes in the last four years. We have gone from a drought situation where Blowering Dam—I have photos—has been at 1 per cent and 2 per cent where we could still drive along the old roads and many people took that opportunity. We then got to the point where we upgraded the dam wall to cater for extreme circumstances. That wall was barely finished when we had the floods. In 2010 we had significant flooding in September, October and December. By the time the December floods came, the spillway was actually spilling. That created unbelievable pressures on our community because when the dam is spilling it has absolutely no opportunity to be there for flood mitigation because you cannot hold back the waters when the dam is at 100 per cent.

We understand that need during times of drought, but we need to have the dam managed appropriately so that it does not impact on our communities as it did in December 2010 when we had a compound of the dam actually spilling and significant rain events. It is not a matter of not providing water during drought; it is a matter of managing that dam so that there is an air space. At this point, even though 88 per cent is the recommended technical level, there is nothing that binds it to do that. This means that when it gets to 100 per cent, it is up to the legislation that insists on environmental flows and the delivery of water if it is so needed. That is our other conundrum. When there is really good rain the irrigators are not requiring the water as much, which means that the dam builds up. But this is where I keep coming back to. We need the same consideration for our community as we are looking at the consideration of the communities that require water for irrigation.

The Hon. STEVE WHAN: I understand that. I guess, though, what we need to look at is—five years ago in the midst of the drought had we had air space which had been reserved at Blowering Dam, what impact would that have had on the delivery of water for irrigation downstream? Has anybody done an assessment of that? How much sooner would they have gone to zero allocation for general water?

Ms THOMSON: I do not have the technical qualification to be able to answer that. I just know that when you are in drought, flood mitigation and air space is not an issue because the reality is that when you are in drought you are already below what would be considered to be an air space to provide that flood mitigation.

The Hon. STEVE WHAN: But it is an issue as you would be starting with less water stored. So it would be an issue for downstream users.

Ms THOMSON: But if we are in drought it would be unlikely we would be at 88 per cent full.

The Hon. STEVE WHAN: I understand.

The Hon. Dr PETER PHELPS: If I could interrupt, if you have as your benchmark 88 per cent but because you want to have a flood mitigation strategy you reduce it to 70 per cent, for example, when a drought next comes around you are missing 18 per cent of capacity because you have instituted a flood mitigation strategy rather than water retention strategy and that is a problem. We are looking at two competing interests here. You want a flood mitigation strategy but those further downstream say, "We want as much water contained as possible.

Ms THOMSON: And this is the point I come back to. Does our community not deserve the same level of consideration? We have landowners the full length of the river. This is our river and this is our community and our economy as well, and we very much value and appreciate the irrigators. I would expect that they come in and they fight really hard to get the water delivered to them so that they can grow their crops. That is why I am here to fight for our community because we need to be considered as well because if we are going to be put in a position where you are saying it is okay for us to flood to ensure that we can provide water when needed to the irrigators, then we are not doing our job to protect our community's interests because that river to us is more than an irrigation canal, which is what it has been turned into.

The Hon. STEVE WHAN: I understand your position but I think if you are going to assess that, if you are going to make a judgement about the relative cases you have to be able to assess what the impact of that is for everybody downstream.

Ms THOMSON: Maybe that is something that a study does need to be undertaken on but at the moment 88 per cent was what was agreed to, not 70 per cent. The difficulty that arises is that when we move up to 100 per cent of capacity and we get a significant storm—we are in the middle of our thunder storm season at the moment; we were lucky this year, as we did not have a significant snow melt down so we have managed to keep it under control this year. But we should have learned a valuable lesson from December 2010. If we need to undertake a study to understand what the impact of the draw-down would be, or should I say the air space, then we need to do that. But I cannot come up with an answer for that today. I just know that from our perspective we deserve a consideration in our community to keep our community safe and protect our landowners, just as much as we are looking at providing water for the irrigators downstream.

The Hon. MICK VEITCH: What is the membership of the Tumut River Advisory Committee [TRAC]?

Ms THOMSON: The Tumut River Advisory Committee, there is the Department of Water, I think; we have a lot of landowners on there; council has two representatives; there is a councillor representative and also a staff member. Mr Paul Mullins is on that. The new councillor is Scott Stevenson. He is the new member for TRAC.

CHAIR: Would you be able to supply us with a list of membership?

Ms THOMSON: Yes, certainly. I should add that it is very difficult to ever get the Department of Water to turn up.

The Hon. MICK VEITCH: I want to talk to you a bit further about the recent flooding events in the Tumut River system. One issue—we saw it yesterday—was a very high-tech and exciting way of measuring the water flows here at Wagga Wagga. One issue you raise in your submission is the lack of lead-time information on flooding events coming down the system, not only at Goobarragandra but also Adelong Creek, which goes further into the Murrumbidgee. Do you think there are enough gauging stations or measurement points in the upper catchment?

Ms THOMSON: No, and that was an issue that was raised very much by the SES. In fact, what happened with the significant event at the Goobarragandra is that that station was taken out and that was basically the end of the information coming through to the community. I do not know whether you wanted to make any comment.

Mr FLETCHER: It failed at six metres. The Goobarragandra is typically 1.5 to 2 metres. The gauging stations located in the bottom reaches of the Goobarragandra failed at six metres, and I believe the water went to 8.5.

The Hon. MICK VEITCH: What about in Adelong Creek, which is a catchment?

Ms THOMSON: I do not think we have any gauging systems in the Adelong. Part of the problem there came from the significant rain event that came down from Batlow and the issue was it came so fast and so quick that the water had nowhere to go and that is when it flooded the main street. The creek literally became a river through the main street. My understanding—again I am happy to find out more detail and provide it to you—is that I am not aware of any of the recording areas in that location.

The Hon. MICK VEITCH: It would be good if you could let us know, take it on notice. In your submission you talk about the fact that the State Flood Sub-plan does not include Tumut River as a system that is subject to flood warnings and you have raised that. Have you heard anything back about your approaches to have the Tumut River system included in the State Flood Sub-plan?

Ms THOMSON: My understanding is that I do not believe we have received a response at this stage.

Mr FLETCHER: That is right.

Ms THOMSON: Yes, we have not had a response at this stage but we will be pursuing it.

CHAIR: Going back to your comments about the downriver storages, if that was to be implemented, is it suffice it to say that that would solve a lot of your problems, allowing a more even flow to go down river all year without such high flows during the summer?

Ms THOMSON: Yes.

CHAIR: Would that also address the flood mitigation issues that you are looking at?

Ms THOMSON: Again, I am not qualified to make technical responses; I can speak as an individual who is passionate about the river. I believe that if we had a consistent flow rate it would be better not only for the downstream users who would have access to their water year round; it would reduce the amount of requirement in relation to ensuring that we have Blowering at maximum. So I believe that if there was that downriver storage then we would be able to have the air space required. I also think that it would be better for the river health and the erosion issues that are becoming more and more significant. Part of the issue with our erosion also relates to the significant flooding events that we have had. We have lost—and we have included photos—200-year-old gum trees. Technically, you are not allowed to remove those from the river or you have to drag them to one side. But then that starts creating major issues in itself. So the management of flows is critical to the health of our river. If the downstream storage could be incorporated to reduce the rise and fall and the dramatic changes in that flow, I believe that that would go a long way to reducing the impacts. I do not know whether you wanted to comment.

Mr FLETCHER: I think that is right.

CHAIR: So the photos you showed us in the submission you gave today show a flow rate of 4,500 megalitres today. How does that vary at its peak? Is it up to 8,500, 9,000?

Ms THOMSON: Nine thousand. Those photos were taken yesterday afternoon so they are current photos.

CHAIR: If I am reading what you are saying correctly, 9,000 megalitres a day is way too high to sustain.

Ms THOMSON: It is ridiculous.

CHAIR: What do you think is a reasonable flow that should be going through, given that there is this demand?

Ms THOMSON: Don't you sit back on that.

Mr FLETCHER: That is a difficult question.

CHAIR: If it was to be sustained for a larger proportion of the year—that is where I am coming to.

Ms THOMSON: Again, that is something that I think we would need to get some advice on. Somewhere in the middle. The other difficulty for us is that there is also supposed to be a minimum flow and sometimes that does not get met either. So we go from below the minimum to above the maximum and it can happen.

CHAIR: So it would make sense to have a more even flow year round?

Ms THOMSON: A more even flow year round—

CHAIR: Higher in the winter and lower in the summer.

Ms THOMSON: Yes. As I said, at the moment we refer to our river as being turned upside down. It does. It runs very high, fast and cold in summer; very low and warm in winter. It is not sustainable either for the ecosystem or the environmental factors, but also in relation to the erosion that is occurring. I know they are trying to undertake rocking and I suppose rehabilitation of certain areas, but it is playing catch up. They do one thing and then they do not have the funding to do the next part that is required to do that, and that is one of our greatest issues. There is no funding to implement the plans that have been agreed to.

The Hon. Dr PETER PHELPS: Going back to the last big flood event, can you explain the effect of the flood event on the town of Tumut itself?

Ms THOMSON: It is an interesting question. Tumut is built in a valley and it is on a flood plain so we understand that we will have floods from time to time. I have lived in Tumut all my life. My husband and I actually live on the flood plain near the racecourse and the showground. The event in March of this year was the worst that we have ever seen. The river came into our backyard this time and that is the first time in our history. What happens is that apart from what happened within our own town, the community of the Goobarragandra valley was absolutely decimated. Mr Fletcher and my husband canoed through the Goobarragandra. It is now a moonscape. It has taken out literally all the vegetation. It has completely changed the river.

So that will have an on-flowing impact and it is very hard to understand what that impact will be because we have never experienced this before at that level in that area. So we are trying to understand a lot of the infrastructure. We lost so much infrastructure in both Brindabella and Goobarragandra. We have between the 2010 and 2012 events I think close to $30 million worth of flood damage. That is significant on a community. These are the things we are trying to understand. I am aware that Blowering was never designed to be a flood mitigation dam but if we can reduce the impact of flood on our area and we can reduce some of the damage that is created. As I said, 2012 March was the most significant flooding event that I have ever experienced.

The Hon. MICK VEITCH: How bad would it have been if Blowering had spilled?

Ms THOMSON: That is the concern we have. If Blowering had been at 100 per cent and we could not hold any water back from there, I doubt that our house would still be here because the water that would have come down would have taken it out and the amount of pressure. The point that we have raised in this is that for Tumut we are at the very beginning of the flooding. When it happens it happens fast, it happens without a great deal of warning and it happens coming from different areas. Because we have the Tumut River, the Goobarragandra and Batlow, it has the potential, if it is a very wide front, to hit all of those and it all comes together in one point. If Blowering is full and does not allow for any air space at all to be able to hold that water back, then the impact would be incredible. I think we have referred to that in our submission as well.

The Hon. Dr PETER PHELPS: Getting back to the erosion and the shingle river works plan, can you go through that and talk about the funding, where it comes from, how much you get, whether you think it is adequate—I am pretty sure I can guess the answer to that—and what you consider to be your priority works?

Ms THOMSON: It is within the report that the identified amount that was supposed to be allocated towards the river works is I think $1.8 million. That varies. It has varied I think between $500,000 and about $750,000 over the past few years. So that $500,000 is less than half. So you cannot ever expect to actually meet the requirements. It is the same as any other infrastructure: If you do not spend money to maintain it, that money continues to compound so to try to address it costs more and more. We are not even receiving the $1.8 million to undertake the agreed works and that means new problems are being created. I do not think they will go down the river now to identify them because we do not have the funds to do the works anyway.

The Hon. Dr PETER PHELPS: Are you saying that erosion problems with the scheme in the past 10 years are manifestly worse than in the 40 years earlier? Is there any material difference in the erosion?

Ms THOMSON: That is something that we will probably have to go back and investigate. We are working with the information we have before us now. We are experiencing a significant difference from

40 years ago. Blowering Dam was not there 40 years ago, so we have very different styles of flooding. There is no-one in the room who would think that what happened prior to the construction of the dam would be the same as what happens now. It is a different style of flooding. However, the reality is that these significant flood events have created further erosion and the line the river is taking is different. The river has been widened in some areas, which means that the water is going into a much larger area.

I have not experienced the major flooding that happened prior to the dam being built, so I cannot compare the two. We could look at the statistics and see the way that the community was flooded. However, the reality is that the dam is there now and we need to manage it. We cannot say that because it was not there 40 years ago it does not matter if it floods our community now. If it is there and we can manage the water flow and ensure that we do not impose extra pressure on the community by having a dam that is 100 per cent full with significant rain events then it would be irresponsible not to acknowledge that it has a role to play in flood mitigation in our community.

The Hon. Dr PETER PHELPS: What do you need to undertake erosion mitigation? This Committee must make recommendations.

Ms THOMSON: The major thing we need is a reduction in the rise and fall. We need that drawdown to be consistent. It is one of the most crucial things. When you fill the river up to its absolute capacity and it saturates the bank and then you drop the flow significantly in two or three days the banks do not cope—they collapse. Landowners use that land. The same thing happens the next time it rises. It saturates the bank and we lose more land. If that continues to happen, we are taking away from our landowners—and it is their land; they have paid for it. My understanding is that the access line is a metre and a half from the river. Every time this happens they lose land. State Water still maintains its little channel and the landowners keep going further back. We need to look after that. It is significantly and directly related to the drawdown, the significant drop and how quickly it drops. Our banks are really wet at the moment because we have had so many significant flood events.

The Hon. Dr PETER PHELPS: I refer to your suggestion about further storage downstream. Are you suggesting on-river storage or off-river storage?

Ms THOMSON: I am not personally suggesting either. I am simply acknowledging that there is the potential to store water further down the river. That is something I assume the experts would be looking at and coming up with the best fix. I know that when Richard Pratt was alive he considered the opportunity to pipe water. I am not averse to that initiative either.

The Hon. Dr PETER PHELPS: To where?

Ms THOMSON: To run a water pipeline.

The Hon. Dr PETER PHELPS: Going around Tumut and coming out where? Further down?

Ms THOMSON: Yes, to communities that need it. Whether or not it is a form of storage—and I know all the issues of concern about evaporation—

The Hon. Dr PETER PHELPS: The problem the Committee faces is that if it makes a recommendation about river storage the environmentalists will complain that the yellow spotted frog will be killed. However, if it recommends off-river storage there will be complaints that it is creating evaporation ponds. If there were a solution for that then I would love to hear it.

CHAIR: There has been a proposal about mid-river storage at Narrandera. That involves two dry lakes—Lake Midgeon and Lake Coolah. That was the point of my previous question. If that were to become a reality you could have a lower discharge from Blowering Dam over a much longer period to fill that mid-river storage. In the summer when peak flow is happening a lot of water could go from that mid-river storage further downstream, which would reduce the flow demand on your section of the river.

Ms THOMSON: With all due respect, if I knew the ideal solution I certainly would not be sitting in Tumut, working at the school and coming to this Committee as the mayor of Tumut. If they looked at it realistically there are so many other opportunities apart from it just being a water storage facility. There would be a flow-on with recreation and tourism. I do not have all of the answers; in fact, I probably do not have many. I simply know that for us that drawdown rate is a significant impairment to the health of our river. If we are

looking at downstream storage, if it is held together and managed appropriately it can provide a greater service for the community. You lose water to evaporation in just getting it from Tumut to Narrandera. That evaporation is an issue regardless of whether is in the river or being stored and managed appropriately.

The Hon. PAUL GREEN: Your submission expresses concerns about the impact of cold water releases from Blowering Dam on the aquatic ecosystem of the Tumut River and indicates that a strategy has been developed to manage the impact of those releases. What impact do the cold-water releases have? What strategies have been developed to address these problems and what is their progress?

Ms THOMSON: I will answer the last part first. My understanding is that they are not being progressed at the moment; the cost is fairly prohibitive. In answer to the first part of the question, I have referred to it being an upside down river. When water is released from the bottom of the dam the temperature is significantly lower, so the impact on the river system and ecosystems is significant. I understand that one of the ways of addressing that is looking at mid-storage release. That involves drawing down water from different areas in the dam so that the water is not as cold. However, it is an extremely expensive process and is probably cost prohibitive.

Mr FLETCHER: They have done some exploration work on medium- to high-level take-offs. However, some of the ecosystem in the river is very much based on cold water temperature. Trout would not survive in warm water, but native species would. To some extent gross thermal pollution is occurring.

The Hon. STEVE WHAN: Is there an estimate of the cost of the off-take? Where could the Committee find that information?

Ms THOMSON: We could find it. The co-author of the report, Paul Mullins, is on leave at the moment. We could talk to him and get some of that information and detail and forward it to the Committee.

CHAIR: That would be good.

The Hon. STEVE WHAN: We would like information about the planning or costing work that has been done on that. Jindabyne Dam has had one of those off-takes installed and it is working very well. However, it did cost a lot of money.

Ms THOMSON: This is where it all comes back to the fact that we appreciate that there is only one bucket of money and we cannot create more. It is a matter of identifying the things we can manage appropriately in the first instance. It would be significant if we could first look at the drawdown to reduce the impact. That is what this Committee is looking at; it is not looking at the quick fix in a short period. We need to look at the next generation and we should be planning for 50 and 100 years. The Snowy Mountains Scheme and Blowering Dam water storage facility were developed with foresight. That is what we need to be doing now. We should not simply be addressing these immediate issues. We should be looking at how we can provide water facilities in the future. It scares me that water is reducing and people still seem to think it is infinite and that it will continue to generate itself—it will not.

The Hon. PAUL GREEN: I am interested in the impact of the cold water. Does someone establish whether the trout population is decreasing? What measurements are taken to assess these impacts?

Ms THOMSON: I cannot answer that off the top of my head. We can take that question on notice. I suppose it comes down to the fact that we start hearing people saying it is impossible to catch fish in the river. We have a very active acclimatisation group that is continually releasing fingerlings. However, because the river is also very fast and cold, we can put them in in Tumut and they end up in Gundagai. The habitat is very difficult. The other concern is the amount of rock work being done. That impacts on our platypus. Mr Fletcher regularly paddles down the river and by doing that he becomes more familiar with and aware of some of those areas. He might be able to detail the impact on the system.

Mr FLETCHER: I imagine the species that are prevalent in the river these days have nothing to do with native populations. The chart I provided shows that the temperature is approximately 10 degrees in the summertime. Thermoclimes develop in the bottom of the dam where the water is very cold. It is a completely inverted situation; it is opposite from what would be natural.

The Hon. PAUL GREEN: Has there been any discussion about mixing the water? They talked about dead water at Warragamba Dam. They were talking about deoxygenated water and mixing it to increase the temperature.

Mr FLETCHER: I do not think council has been involved in any of those discussions.

Ms THOMSON: This is where it is really difficult. Council does not have any control over the river. We are an invited third party even though is it such a significant issue for us. We do not have the authority to do any work or even to refuse to allow things to happen. It is almost like we are standing with our hands behind our back and asking how this can be happening. We do not get to say what we want; we are a guest on the Tumut River Advisory Committee. We do not have an ultimate say in what can and cannot be done. I assume that even mixing the water would be a costly exercise; it would be expensive to get the water from somewhere other than the bottom to provide that better temperature.

The Hon. PAUL GREEN: You mentioned trees falling in because of erosion and you said that there are different guidelines about what you can do with them. You cannot remove them at all; you can only pull them aside.

Ms THOMSON: Technically speaking, we are not supposed to remove anything from the river when it falls in. We must obtain special permission. That was a major issue after the floods in 2010 and 2012. Debris falls into the river and every time there is another rain event it becomes like a beaver dam and builds up. It then starts forcing the river into other areas. It is also taking out a lot of our infrastructure. We are talking about massive trees. Technically all we can do is to drag them to the edge of the river.

The Hon. PAUL GREEN: What would you like to see happen?

Ms THOMSON: Each situation needs to be assessed and managed appropriately. My personal belief is that there are times when those trees need to be removed because they force water around them and erode more of the riverbank. It does not make sense to rock a wall and leave a dead tree in place for habitat if the creature you are leaving it there for cannot survive in the river because it is the wrong temperature. We are confusing the environment with irrigation and all of these other issues. We need to find the balance in managing all of these things. At the moment we are getting very mixed messages about the environment being important, which is why we leave the trees, but the river is not flowing naturally and the temperature is not natural so it cannot sustain native fish. We need to come up with a balance and we need to understand how we do that.

The Hon. PAUL GREEN: Some submissions have been critical of the influence environmental groups can exert on a proposal for water storages and water diversion schemes—for example, submission 29 from RAMROC. What has been your experience with environmental requirements and groups regarding water storage?

Ms THOMSON: The closest association we have in relation to that would be with Snowy Hydro. It has a commitment to have environmental releases and flows. I will use the 2010 floods as an example. My understanding is that Snowy Hydro is required to release a certain amount of water for environmental flows, and it has to be done within certain periods. Steve may understand this a lot better than I do. The concern is that in a flooding event, by the legislation it is still bound to release certain environmental flows. That then also can compound. We need a common-sense approach to some of these things. I am aware that Snowy Hydro has a commitment to environmental flows, but the interesting thing is that environmental flows is a minimum it has to release for the environment, which is almost an oxymoron in the Tumut River because there are times when we need less water, not more, to look after our environment.

Mr FLETCHER: I would think that the construction of the Snowy Hydro today would be impossible because of the aforementioned green views on not only construction of dams.

The Hon. Dr PETER PHELPS: You are probably right.

Ms THOMSON: Work health and safety as well. The scheme definitely was amazing, but it also is one that we would not be able to construct now.

The Hon. STEVE WHAN: To clarify, my understanding in 2010 was that State Water, or whoever it was, told Snowy Hydro that it did not have to release those environmental flows during a flood situation. I believe you asked me a question about that when I was the Minister.

Ms THOMSON: But we had to actually seek special permission.

The Hon. STEVE WHAN: Yes.

Ms THOMSON: Anyway, it is something that needs to be considered.

The Hon. Dr PETER PHELPS: A bit of common sense would not have gone astray, is that what you are saying?

Ms THOMSON: The trouble with common sense is that it is not that common.

CHAIR: We are out of time. Thank you, Councillor Thomson and Mr Fletcher, for appearing before the Committee today and for your submission. You have taken a few questions on notice. The secretariat will confirm those issues with you. We would appreciate if you could get your answers back to us within 21 days of receiving the secretariat's advice. Again, thank you for appearing and good luck with what is happening in Tumut.

Ms THOMSON: Thank you very much for taking the time to undertake this inquiry. Being a bipartisan group gives us hope that if all levels or sections of the government can come together for such a critical thing, maybe we can achieve an outcome and perhaps look to the next 50 years, not just the short term. Thank you very much for the role you have played and for allowing us an opportunity to present.

(The witnesses withdrew)

MICHAEL PAUL BRAYBROOKS, Chairman, Riverina Eastern Regional Organisation of Councils, Councillor, and Cootamundra Shire Council, and

JULIA MARIA BRIGGS, Executive Officer, Riverina Eastern Regional Organisation of Councils, sworn and examined:

CHAIR: Welcome Councillor Braybrooks and Ms Julia Briggs. If at any stage during the inquiry you consider that evidence you may wish to give or documents you might like to table should remain confidential, please indicate that to us and we will consider your request. Would either or both of you like to make a short opening statement?

Mr BRAYBROOKS: Yes, I would. First, thank you very much for allowing us to make this presentation and also for presenting a late submission. We appreciate that. The Riverina Eastern Regional Organisation of Councils, which is normally known as REROC, is a strategic alliance of 15 local council bodies located in the eastern Riverina region of New South Wales and geographically based in Wagga Wagga. While our region does not encompass the irrigation areas of the western Riverina, our members appreciate the significant role that water plays in the prosperity of the entire region. In addition, our members are actively pursuing strategies to increase population and economic activity in this region. The success of these strategies is underpinned by the availability of water. In 2011, utilising funding from the Federal Government Strengthening Basis Committee initiative, REROC undertook a project that considered the impacts of a world with far less water. One report generated by the project considered the impacts of reduced water availability on the industries within the REROC region. The discussion paper and the final report recognised that less water would have quite clearly a significant impact on the manufacturing, agriculture, and timber and forestry industries, which are integral to the prosperity of the eastern Riverina.

In relation to the inquiry's terms of reference, REROC would like to offer the following comments. Firstly, the only way that rural and regional New South Wales can grow and maintain its industry and agricultural production is to have guaranteed access to a sustainable water supply. If current storages are insufficient to provide that guarantee of supply, then our members believe that these storages should be increased. We note that when water supply to the Sydney catchment was deemed to be insufficient to meet the needs of industry and the population of that catchment the Government invested $2 billion in a desalination plant. Our members argue that similar levels of investment are warranted to support more than $8 billion worth of generated income each year from bi-agriculture and agricultural-valued industries, which operate in rural and regional New South Wales. We also have some concerns in relation to the impact on storage capacity of water held for environmental purposes. Our understanding is that water is primarily held in New South Wales water storages. It is only in limited circumstances that the Commonwealth Environmental Water Holder [CEWH] is able to sell these allocations or entitlements back into the system. We are unclear as to whether there is a ceiling on the amount of water that can be banked for environmental purposes. It is unclear also whether storages have the capacity to meet these demands.

Secondly, our members believe that it is imperative that models be developed for determining water requirements. Our understanding is that State Water currently determines demand for up to 24 months using history-of-use data, environmental water needs, long-term weather forecasts, and IQQM—the integrated quantity and quality models. We note that the modelling does not appear to include projections for population, nor industrial growth. We believe that given the growing competition for storage space it is imperative that State Water have at its disposal modelling capacity that can take into account current demands for water as well as future projections of that water, which may be needed to fulfil urban, industrial and population growth. If rural and regional Australia is to grow and prosper, we need to be sure that the water supply is able to meet these new demands as well as existing demands from agriculture and environmental needs. Our local water utilities have participated or are currently participating in the development of Integrated Water Cycle Management plans—IWCMs. In addition, they have undertaken demand management planning in order to make long-term projections about water needs. These plans take into account actual and anticipated growth in population and industrial development, as well as the potential impact of climate change on water availability and supply security. This information could be fed into the statewide modelling for water needs.

Thirdly, storage management should be approached on a consultative basis to ensure that water is released at optimum times for production as well as for environmental benefits. Over the years REROC has raised the issue of using weirs along the Murrumbidgee River as part of the water storage solution. Weirs could serve several purposes allowing water to be released more slowly from water storages. It is our understanding

that water currently released for irrigation comes down the Tumut River at a very fast pace. I know that that has been the basis of the presentation from Tumut Shire Council, which you have just heard. We repeat that our understanding is that it is to the detriment of the fish habitat and breeding because of the cold temperature of the water and the erosion. We believe that the strategic use of weirs could mitigate this by allowing staged releases that would lessen the speed of the water, resulting in less impact upon the habitat. We believe also that weirs could provide some mitigation for floods, capturing excess water en route. On 5 March this year central Wagga Wagga was evacuated as a result of flooding water moving down the Murrumbidgee. The evacuation displaced some 8,000 residents and closed all the businesses located in the central business district, costing millions of dollars in lost time and productivity. North Wagga Wagga was inundated with hundreds of evacuated residents and homes destroyed by flooding waters. We believe that deep water weirs strategically placed en route would provide assistance against this occurring again. We strongly suggest that the Committee consider the work undertaken as part of the Pratt Water Murrumbidgee project, which contained a number of recommendations for the management of the water resources with the aim of reducing water losses.

Fourthly, water could be released from dams and parked in weirs awaiting use. We believe this approach would lessen water transmission losses. As I have mentioned before, the Pratt water project recommended a number of initiatives to the Murrumbidgee with the goal of improving water efficiency, which include, and I bring to your particular notice, just-in-time water delivery capacity to match product marketing demands, investment in water measurement information systems, refurbishment of irrigation channels using new piping technology, new piping of stock and domestic water supplies, and an increased investment in water efficiency technologies in general. Fifthly, REROC has not undertaken any research into this particular issue, therefore makes no comment. Finally, another matter we would like to raise is the importance of the town water supplies. Often in the water debate the needs of towns seem to be lost. While REROC appreciates that urban water represents only a very small proportion of the total water take, it remains its most vital role, that is, water for human needs. In this area water for human needs in the form of town water only removes 2 per cent of the water made available. I know generally it is 4 per cent but because of the amount of irrigation in this area we are as low as 2 per cent.

Town water is not only used by residents but by manufacturing and other small industries, which underpin the economic life of rural and regional New South Wales. It is imperative that town water supplies are not only guaranteed but there is also some provision for growth. We encourage members of this panel to consider this issue in their deliberations. We thank the Committee for this opportunity to provide this late submission to the inquiry and also for the opportunity to address the inquiry.

CHAIR: Thank you for your very interesting submission. You have raised some good points. We have not bypassed the urban water issue. That certainly was in the terms of reference and we have already had a number of discussions with various groups about that so we are fully away of that.

The Hon. MICK VEITCH: And generating some media as we go.

Ms BRIGGS: I guess you can appreciate in this part of the world it tends to be the lesser end of the discussion.

CHAIR: Yes.

The Hon. PAUL GREEN: The submission we received from Professor Stuart Khan at the University of New South Wales discussed the dual roles that dams could play both in water storage and within flood mitigation. Do you have any comment on the dual role of dams?

Mr BRAYBROOKS: As I said in my submission—and it would be incredibly remiss when it is such a major issue which has occurred in this particular community of the flooding of north Wagga and the closing of the CBD—the disruption it caused was enormous. Obviously therefore we raised the issue. We strongly support the use of either deep water weirs or dams, and I believe there is a technical difference between the two.

The Hon. PAUL GREEN: Can you briefly explain?

Mr BRAYBROOKS: I assume that a weir is a far lesser structure and a dam is a more major structure and we are considering a series of smaller structures. Weirs would be much more suitable for flood mitigation and certainly while I know that Wagga Wagga City Council is in the process of undertaking major work on the levee banks in this town, part of the issue I feel would be not only levee banks but also weirs to at least hold

back some of the water and to allow it to flow at a slower rate down the Murrumbidgee when there is significant flooding in the upper catchment.

Ms BRIGGS: While we appreciate that there seems to be a conflict between the role of dams for water storage and the role of dams in flood mitigation, I guess the Ivanhoe issue in Queensland highlighted what is the purpose of a dam. But as Councillor Braybrooks said, when you look at the level of destruction that occurred in this region in March when the water was released from the dam I think it is something that perhaps this Committee needs to address and determine when that conflict occurs what should be the highest priority here. I know that others have suggested some kind of on-route solutions. We are calling them deep water weirs.

Obviously we are doing that simply because we recognise that a lot of the discussion is that when you put in en-route storages you get evaporation issues. We are saying, "Why don't we put in something with much smaller surface areas and much more depth to reduce that?" While there remains no solution that can be implemented easily, I think it would be useful for this Committee to make some recommendations about how that conflict needs to be addressed. We heard Councillor Thomson talk about the issues that arose in Tumut. I recently had a friend up in the Goobarragandra and it is decimated. My friend said it looked like Bosnia, Syria or something like that, the damage that had been done by the water. So there needs to be a solution put in place.

The Hon. PAUL GREEN: That is why we are here. If you had a recommendation that you would like us to take forward what would it be?

Mr BRAYBROOKS: That you investigate the use of deep water weirs in flood mitigation particularly. Nobody is under any illusion that the issue of flooding in river basins is a natural phenomenon. After all, the community of Gundagai was completely removed from its original site because it completely flooded and they knew there was nothing at that stage they could do about it. Therefore they moved the whole township of Gundagai up onto the hill. Fine, but there is now something we can do about it, and deep water weirs or at least controlling the flow of the water that comes rushing down from the upper catchment in the time of storms is an effective engineering answer to the problem.

Ms BRIGGS: One of the things we talk about with climate change is the fact that we will have more extreme weather events. We have experienced in this region two major floods in less than 18 months—flood events that we have never seen for maybe 20 years. If climate change results in major events like this, I think that the infrastructure we put in place needs to recognise that and certainly REROC has been talking with all of its councils about issues around improving the size of drainage for stormwater and in recognition of the fact that flood events and extreme weather events will occur more regularly. If that is the case, and if we say that we believe it to be the case—and certainly in this region it appears to be the case—then we need to have some kind of solutions to deal with this. Just releasing water from the dam when we are about the flood is certainly not an economically wise choice. Also, I would argue that it is not a sound environmental choice either because of the damage that is done. The habitats that have been lost in the northern parts of the Tumut River will take maybe 20 years to replace, if they ever come back. So I think a recommendation needs to be made in relation to it. For us, we are thinking en-route storage might be the most viable of the solutions.

The Hon. PAUL GREEN: Do you have any reports on that from which you have drawn that conclusion that we can compare?

Ms BRIGGS: Pratt.

Mr BRAYBROOKS: Pratt would be the definitive report.

The Hon. PAUL GREEN: Do you view levee banks? There is a levee audit going across New South Wales now. Are you for them or against them? Do they work in your experience?

Ms BRIGGS: Do levee banks work? They work as long as long as the water does not get too high. If the water gets too high they do not work any more.

The Hon. PAUL GREEN: Are they helpful in mitigation?

Mr BRAYBROOKS: Let us be honest, they are a mixed blessing. They tend to direct water elsewhere. It would be a much more environmentally as well as socially acceptable response to stormwater within the river itself and then I consider that deepwater weirs are storing the water within the river itself, rather than flooding

everything outside the levee bank. Again, coming back to the personal experience of this community in Wagga Wagga, the extensive flooding from north Wagga Wagga through to the outskirts of the city limits was amazing to see and that flooding lasted four or five days until the river suddenly started going down and then it ceased. But it flooded a very large amount of not only homesteads, industry and also particularly agricultural land.

CHAIR: I might just explore that concept of deepwater weirs a little further. I think you just made mention of them a minute ago when you said that these weirs would under normal conditions be deep water, they would basically be empty and the normal flow of the river would be going straight through. Is that what you have in mind?

Mr BRAYBROOKS: While obviously I am not a hydrologist or a water engineer in any way, my concept is that you would have these, especially when there was an anticipation of a flood event, you would create quite an air space in these to allow the slowing of the floodwater as it came down the river to be held back for a short time. That would be my concept. Yes, you would not hold them empty but you would obviously empty them before the event when you knew there was going to be a known flood event you would at least create a significant air space in them and you would obviously in that way the water to be retained in stages down a river that way.

Ms BRIGGS: To pick up Councillor Thomson's theme as well, one of the other things we could see these en-route storages doing is the ability for State Water to release irrigation water in stages instead of all in one hit. So over a period of time the water could be released much more slowly and it could be stored en-route in preparation for release much further downstream. We would also argue that doing it that way may well also mitigate some of the transmission losses that occur because the water is being stored instead of being tried to get from point A to point B very quickly for irrigation.

CHAIR: From a flood perspective, the problem would then arrive when everything was full and that is generally when major floods occur when the catchment is wet, everything is full and it continues to rain.

Mr BRAYBROOKS: It is called the saturation point, yes. Obviously that is the limitation of the system. You have to hope that it still has some benefit, that some water could have been released the days before, but you are quite right. There are limitations to the system.

The Hon. Dr PETER PHELPS: Who do you envisage would have control over these weirs and what levels they are set at?

Ms BRIGGS: State Water, I would have thought, in consultation with the communities and the stakeholders.

The Hon. Dr PETER PHELPS: I have heard some people say there are additional reasons for that in that weirs would allow a significant body of still deep water which could then be used for commercial and recreational activities. Is that part of your thinking in promoting this?

Mr BRAYBROOKS: In all fairness, I think that is a positive spin-off, a supplementary. To us, the deep water weirs are for controlling the water descending the river system. This is one of the major positive points that is made by the Pratt water report and secondly obviously from flood mitigation, given the experience of the last two years in this community.

Ms BRIGGS: To pick up on that theme, too, I think that for recreational—not so much industrial—uses people are generally looking for wide expanses of water in which they—

Mr BRAYBROOKS: Shallow.

Ms BRIGGS: And shallower water. We certainly see this here in Wagga Wagga with Lake Albert. It is quite a large expanse of water—

The Hon. Dr PETER PHELPS: When it exists.

Ms BRIGGS: It exists beautifully at the moment but it is a good example of shallow water over a large space. You can get massive amounts of evaporation. It is the biggest problem that the space has. But it is great for recreation when the water is there. So we would think that the en-route storage we are proposing, the

primary purpose for that is for flood mitigation and to slow down the river so that we have water storages along the way. The spin-off benefits would be some recreation but the storage itself should be built primarily with the other goals in mind, not compromised for recreation use. I certainly think there is to a degree some conflict between building water for recreational use and building water for storage.

The Hon. Dr PETER PHELPS: I take you back to your criticisms in the paper about State Water's modelling for future expected water use. We have to make recommendations coming out of this. Are you saying that their current modelling is too backward looking in terms of future demand and that they should be taking a bit more of a proactive approach looking at future mining interests, future population growth? Are you saying they should be a little more predictive and a little less reactive in their future water modelling?

Mr BRAYBROOKS: It is our understanding that they look forward two years and that they really do not take into account exactly what you have said; that is, any likely increase in industrial growth or population growth. We are saying that some of that information would certainly be available through local water authorities, which do integrated water cycle management. They have to do some future growth predictions. As such, it is a shame that they do not consult the local water authorities to get some indication of what is likely to be the demand beyond two years.

Ms BRIGGS: Our submission states that some of our councils have purchased high-security water for economic development. They are concerned that there will not be sufficient water in the system if they attract a new large business that uses a lot of water. Much of the industry that occurs in this region is value adding to agriculture and by its very nature it tends to be water intensive because it involves reprocessing food and things like that. I will not even mention mining now.

The Hon. Dr PETER PHELPS: I think you will have to.

Ms BRIGGS: There is not a lot of mining in our region, although there is some at Bland. Mining is an issue and a lot of miners have the same high-security water problem. It is somewhat indicative that a rural council is buying high-security water in the market to underpin its economic development efforts because it cannot be sure there will be sufficient water in the town system to support a new major industry. Perhaps that is the reality of the world we live in. We believe there should be some kind of predictive modelling that allows small towns to expand. There seems to be a thought that smaller communities in rural New South Wales will disappear, so we do not necessarily need to provide them with anything that will allow them to grow.

We do not subscribe to that perspective. We think that communities should be able to make their pitch and attract who they can. They should have the appropriate infrastructure to support those kinds of efforts, and water is one of those infrastructure elements. It does not matter how good the town water system is if it cannot get water. It becomes a big problem. Some of our communities have struggled to get water to new housing subdivisions. That is why we are suggesting the need for something that looks at prediction and growth. Visy in Tumut is looking to double its size and Cargill Wagga has doubled its size. They are all heavy water users and they need to go to the market to buy high-security licences to support their growth because communities cannot maintain them with their urban water supplies.

The Hon. Dr PETER PHELPS: As the size increases the hard surface area increases. Are you aware of any initiatives in the region involving stormwater harvesting?

Ms BRIGGS: A number of our councils have looked at stormwater harvesting. We have also looked at it from a regional perspective and we are undertaking regional projects. We have recently done a series of reports on a world with less water scenario, which also addresses stormwater harvesting projects that can be undertaken in the region. Virtually every council in the region does extensive effluent recycling. Most of the sporting field operators in the region do it. Cootamundra certainly does it.

Mr BRAYBROOKS: We did this before it became common; we did it about 15 years ago when we put in 100 per cent effluent recycling. Not a single drop of water goes back to the environment that is flushed down the toilet or washed down the sink. Every drop is brought back into the town and treated in a series of lagoons. Part of the cost of the infrastructure was borne by the State Government as a trial because we were one of the first communities to do 100 per cent water recycling. However, stormwater recycling and harvesting is not undertaken to any extent in this region. As Ms Briggs said, we are certainly involved in effluent recycling. We are talking about a large amount of water that goes back through effluent recycling. It is water that can

obviously be used where you do not need to use potable water but normally you would. We have cut our potable water usage.

The Hon. Dr PETER PHELPS: If there were a financial incentive—for example, a partnering arrangement with the State or Commonwealth Government—would your councils look at stormwater recycling?

Ms BRIGGS: Our councils have already started to look at it and we have identified projects. The Commonwealth Government offered funding for stormwater projects and as a region we felt we needed to identify those projects. There is no question that we would embrace opportunities depending on the structure of the funding.

The Hon. Dr PETER PHELPS: How many deepwater weirs do you think would be appropriate on the system?

Mr BRAYBROOKS: We came up with the concept rather than specific answers. I would leave that very much to hydrologists and engineers in general. We feel that the concept has real benefit, particularly to communities near the river like Gundagai and Wagga Wagga.

The Hon. Dr PETER PHELPS: If you installed a two-metre weir at Wagga Wagga you could have almost 20 kilometres of stored water behind it.

Mr BRAYBROOKS: You would, and it would be a great deal of water. We felt that the concept was worth raising, but we do not have specific answers.

CHAIR: Would you be able to give the Committee a list of the stormwater harvesting projects and advise the stage that they have reached in the Riverina Eastern Regional Organisation of Councils area?

Ms BRIGGS: Sure.

CHAIR: That would be very interesting.

Mr BRAYBROOKS: Certainly.

The Hon. MICK VEITCH: Councillor Thomson spoke about water gauges, river gauges and water telemetry sites—or the lack of them—in the upper Tumut. I am speaking about the Goobarragandra-type catchments and Adelong Creek. The Committee was shown a state-of-the-art measuring process at Wagga Wagga yesterday. It was an unbelievable display by the water authorities. Do your member councils have a view about the adequacy of the current measurement processes in the river?

Mr BRAYBROOKS: Not a definite view, no. However, we note that one of the recommendations of the Pratt report relates to a more efficient and extensive water monitoring system. The reality is that unless you are aware of what is going on and you monitor you will always have an issue with flooding on a river like the Murrumbidgee River. It will always happen and it will happen repeatedly. The river has flooded since time immemorial and that has caused major issues since the arrival of white men and European settlement. Unless we monitor it better we will not be able to predict it or deal with the social and financial devastation that results from flooding.

The Hon. MICK VEITCH: Mention was made of urban water supplies. Central NSW Regional Organisation of Councils gave a presentation to the Committee on Tuesday in Orange. It has produced a significant report about town water supplies and their interconnectedness. It was evident from the map provided that it would be beneficial to connect the Goldenfields Water County Council water pipes at Young to the central tablelands pipes, which run a very short distance apart. Perhaps the Murrumbidgee River could be connected to the Lachlan River and it could then be connected to the Macquarie River for town water supplies. Are you aware of that report and have you given any thought to treating town water supplies not as an individual community issue but much more broadly and supporting each other's community?

Ms BRIGGS: We have two county councils in our region, so water supply is not individual. The only councils in our region running their own water are Tumbarumba, Gundagai and Tumut. Cootamundra is reticulating some water into its urban areas through an arrangement with Goldenfields. With the two county councils we find that water is managed on a regional basis. Central NSW Regional Organisation of Councils'

report deals with water security. It is obviously driven by the major issues that occurred with the Lachlan River. The water was basically turned off, so it is understandable that it has done that. I understand that all the councils in that region are in fact the water authorities. There is not a lot of coordination. Our region is very different. I think there are only five water country councils in the State, and we have two of them.

If the Committee is looking at how those kinds of arrangements can work, what is happening in this region is a good example. Goldenfields is feeding water to nine communities and they are all interconnected. Interconnection is already occurring. The water going to Junee then goes on to Temora and then to Cootamundra and Bland. They are all interconnected and that works very successfully. They manage their water so that no-one is left behind.

The Hon. MICK VEITCH: I refer to the management of the water in the river systems. Councillor Thomson made a comment about the downstream stakeholders also needing to be aware of issues affecting the upstream stakeholders. This comes down to communication. What is the communication like along the river and how can it be improved?

Mr BRAYBROOKS: Without wishing to be deemed cynical, I have never met a situation where communication could not be improved.

Ms BRIGGS: The councils in this region get together every second month and the water county councils are part of the regional organisation of councils. We also have an urban water group that meets to talk about urban water issues. The stakeholders not at the table in our region are the industries, State Water and so on. However, from a local government perspective, the communication is good. As Councillor Braybrooks said, State Water should take into account things like predicted urban and industrial growth in relation to water needs. Those kinds of things are not necessarily happening.

The Hon. STEVE WHAN: I have been looking at the Pratt report and I cannot see any identified options for deepwater or off-stream storage between Burrinjuck, Blowering and Wagga Wagga. Did they identify areas?

Ms BRIGGS: It is our understanding that at some point there was discussion around doing these things, not necessarily in Tumut but just on-route storage. We are not picking out a particular area. Hydrological issues will determine the most effective location. The Pratt report came down very heavily on piping against transmission losses. There are about 20 recommendations, I think.

The Hon. STEVE WHAN: A number of the recommendations are being implemented such as just-in-time delivery, water measurement information, irrigation channels and piping for stock and domestic uses. I got the impression that the earlier witnesses were talking about piping in a more extensive way from the dams. Do you understand that to be part of it?

Ms BRIGGS: My understanding from Pratt was that that was one of the things. The use of open channels was a particularly ineffective way of delivering water. There was a lot of leakage and a lot of evaporation. By piping the movement of irrigation water we would achieve substantial savings in water just because we would stop the evaporation and the leakage. In support of our friends in Tumut—I heard Councillor Thomson's comments—it is a little unfortunate that Tumut River is used as an irrigation channel. There are long-running environmental problems occurring in Tumut because we have made that decision to use it as an irrigation channel. I appreciate that this is a major infrastructure issue, but the piping of the water for irrigation would significantly change the Tumut River landscape and would lead to substantial savings in the water anyway.

The Hon. STEVE WHAN: It would be interesting to see an actual assessment because I suspect the Tumut River evaporation would not be all that high.

Ms BRIGGS: No, because it moves so quickly.

The Hon. STEVE WHAN: You made a point earlier about country town water supplies for domestic and industrial expansion, which included a negative implication about towns having to buy high-security water. If you were considering major industrial developments, would it not be more equitable for them to buy water against all other potential users, that is, mines or irrigators, rather than just being entitled to have that water? Why is it inequitable to do that?

Mr BRAYBROOKS: I very much take your point. I think I did say it was small businesses; I was not talking about multimillions or major development. I am not talking about a goldmine out at Bland. I am talking about a small industry, which happens to require quite a lot of water inside the industrial land inside a town boundary. Obviously, they would anticipate that they could have access to the potable water supply. All I am saying is that we need to make a provision not only for population but also industrial—without large industrial, such as a mine or whatever. I totally agree with you: they are major users and should compete in the same market as irrigators or whoever wishes to acquire that water. But if you are talking about small industry, small factories et cetera that still require a fair amount of water, we are just saying that provision should be made for them to have some access.

The Hon. STEVE WHAN: Are you saying they should not have to pay the same rate?

Mr BRAYBROOKS: No.

The Hon. STEVE WHAN: Or they should not have to be in the market trying to buy it?

Mr BRAYBROOKS: I am saying for the smaller industrial I would have thought they could be in the same market as other smaller industrials within town boundaries. The reality is that these days a lot of them are having to purchase water outside their normal town water supply system.

The Hon. STEVE WHAN: Canberra has bought high-security water to supply its future needs. Is that unfair?

Ms BRIGGS: Does a business in Sydney have to buy high-security water?

The Hon. STEVE WHAN: No, but they are paying market price.

Ms BRIGGS: Maybe there is a market mechanism in there. If you expand in country New South Wales then you have to buy your water; if you expand in the western suburbs of Sydney, you do not have to buy any water. It is quite an inequitable situation.

The Hon. STEVE WHAN: Is it just that you want them to be able to guarantee the supply? Do you want them to be able to get it cheaper than the market price?

Ms BRIGGS: No. We want guaranteed supply. I am not sure that it is an equitable situation. Businesses or councils in our region would have to go out into the water market to get water when not a council in Sydney, Wollongong or Newcastle has to do that, nor is there a business in those areas that has to do that.

The Hon. STEVE WHAN: But we do have a finite supply.

Ms BRIGGS: Yes, but in Sydney you put in a desalination plant to take care of that, whereas out here we just go without.

CHAIR: We are out of time. You have taken a number of questions on notice.

Mr BRAYBROOKS: Yes.

CHAIR: The secretariat will confirm those with you and we would appreciate if you would get your answers back to us within 21 days of receiving them. Ms Briggs, did you want to table something?

Ms BRIGGS: We brought copies of reports in Strengthening Basin Communities, A World with Less Water. We will table those for your light reading.

Documents tabled.

CHAIR: Thank you very much for that. Thank you for attending today and for your comprehensive submission.

Mr BRAYBROOKS: Thank you very much and thank you for the opportunity.

(The witnesses withdrew)

(Short adjournment)

RICHARD THOMAS BULL, Chairman, Water for Rivers,

NEVILLE WILLIAM SMITH, Chief Executive Officer, Water for Rivers, and

JOHN ALEXANDER SKINNER, Project Director, Water for Rivers, sworn and examined:

CHAIR: If you should consider at any stage of your evidence that any evidence you may wish to give or documents you might wish to table should be viewed only by the Committee, please advise us of that and we will consider your request. Would any one of you like to make a short opening statement?

Mr BULL: I would like to make an opening statement, but rather than take up the whole five minutes I would like both Mr Smith and Mr Skinner to add to it. Water for Rivers was set up to save water and to return those savings down the Snowy River and the Murray River; 212 gigalitres down the Snowy River and 70 gigalitres down the Murray River. That was nine years ago. We have already exceeded that target and we are continuing to finish some of the programs that are still ongoing. One of the projects which we have initiated was a project called CARM, which stands for computer-aided river management.

This particular project we describe as our trophy project because, although we have been doing a lot of stock and domestic supply systems, closing down or decommissioning lakes like Lake Mokoan, Barren Box Swamp, et cetera, doing a lot of other work with irrigation companies, especially in northern Victoria, the CARM project in particular is a world first. After an exhaustive process of tenders, the Danish Hydrological Institute [DHI] was the successful tenderer. Together with DHI, Water for Rivers and State Water have been in partnership delivering the CARM project on the Murrumbidgee River. It is our intention to extend CARM across New South Wales. We have the support of the New South Wales Government to do that. However, we still have to overcome some funding issues with the Commonwealth and of course developing a final business plan for the New South Wales Government too. I will ask Mr Smith and Mr Skinner to add to that.

Mr SMITH: I suppose to get a simplistic idea of what CARM is, as Mr Bull said, it is computer-aided river management. Effectively, it is developing a similar process for river management as we expect of our electricity and our urban water management. So in a more academic sense it is reducing the waste, minimising the waste. And in doing that on the Murrumbidgee River, the proposal that was accepted from DHI effectively modelled that 200 gigalitres per annum could remain in a normal year, on an average year, would be held back in the reservoir; it would not be needed to run the river, as it were, and still meet all the customer requirements, including the environmental requirements.

At this stage the Office of Water modellers are saying there is probably 100 but that has come from zero to 100. We are still saying we think that is highly conservative but even if we accept that this is 100 gigalitres that can be not committed to the river in its operation because of a tighter system of management, then that is another 100 gigalitres of water which is under command basically. It has not gone. I suppose another analogy might be the dripping tap. We get our water bill and say, "My god, where has all that water gone?" It is the dripping tap in the bathroom that is going all the time. You have had no benefit from it but you are still losing that water. We are saying the same. With the current systems that the State Water Corporation has to operate with, its current tools, they do not have that degree of finesse to manage the river. What CARM does is give them that degree of finesse to manage it much tighter, much leaner, and retain water in a position where they can have command of it and utilise it in a beneficial way.

Mr SKINNER: We have worked on the river system for quite some time. We have worked with irrigation corporations. We had seen the way in which irrigation corporations like Coleambally had tightened up their system by applying technology and we had seen the issues we had with many of our projects along the Murrumbidgee with loose data, loose management of the river, losing effectiveness of a lot of our projects along the Murrumbidgee. So we decided, why could we not apply a similar technology that has been applied in the irrigation corps to a regulated river system, which we successfully did. My colleagues mentioned DHI. That is an international company but the underlying software or modelling software that we use in the system is a product called MIKE 11 and it is the most common hydraulic software used in Australia and overseas.

I think there are about 5,000 users in Australia so it is not something that we are relying on an overseas supplier. CARM has the ability to have many flow-on effects as well in terms of delivering service, delivering irrigators their water on time and also a huge benefit in delivering environmental water, which I do not think has been realised to its full extent. It is a hydraulic model; it can tell you what amount of water you need to get over

the type of a silt level into a wetland. It will tell you what the collateral damage will be along the way, if there is any, and it can enable you to piggy-bank on individual tributary flows as well. So it reduces the amount of environmental water that you need.

Mr BULL: At some stage during the presentation we have a video.

CHAIR: Perhaps we could do that first.

Video Presentation.

CHAIR: Thank you for that. It was very informative.

The Hon. STEVE WHAN: We have heard quite a bit about CARM over the years. I am very interested in your proposal to do this for the whole Murray-Darling Basin.

Mr BULL: No, it is only in New South Wales.

The Hon. STEVE WHAN: The bit that matters to us. Do you have any estimates of how much water can be saved by implementing this across the whole basin?

Mr SMITH: We are of the view that in the order of 400 gigalitres could be involved on average across the year, but sometimes it could be more and sometimes less. That involves the Murrumbidgee model, which was done in significant detail, and extrapolating it to the other rivers with a high level of conservatism.

The Hon. STEVE WHAN: That is in addition to the 200 gigalitres you estimated coming from the Murrumbidgee River?

Mr SMITH: No, that incorporates the 200 gigalitres. However, as I said, using the integrated quantity and quality model, which is a quite coarse hydrometric model—but it is only one the Office of Water has—they are agreeing that there is 100 gigalitres in the Murrumbidgee River, not 200 gigalitres. Again, if we apply it across the State there is a reasonable probability that they would agree on 200 gigalitres. However, I must stress that the water that is captured—I need to choose my words carefully—is not actually a saving because it has to be released over a period, probably within the water year or the next year, to provide end-of-system flows that are required for the overall basin. The operator of the river, the State Water Corporation, has the choice of when to release the water and how much to release and what it will do with it along the way. It can be released to provide an environmental flow perhaps in South Australia and it meets the end-of-system flow targets. I again refer to the analogy of the dripping tap: It is going down and providing no real benefit to anyone.

The Hon. Dr PETER PHELPS: Except South Australia.

Mr SKINNER: To take the analogy further, the water from the leaking tap does not reach South Australia; it gets lost along the way. If we captured the water leaking from that tap in a bucket and stored it we could release it on command and distribute it effectively.

The Hon. STEVE WHAN: What is the estimated cost of doing the rest of the New South Wales part of the basin?

Mr SKINNER: It is $40 million. A national water meter initiative is being rolled out to replace and standardise water meters. Ideally, CARM would be rolled out with that and it would provide significant benefits. It obviously depends on meters being accurate. If that information is not there then there is insufficient data to operate and manage the system. We have demonstrated on the Murrumbidgee River that there is a 20 per cent impost added to the cost of the meters. So it would be $40 million.

Mr BULL: We have had validation done by other companies. SKM did one on the northern basin about two years ago. It came up with a minimum of 79 gigalitres and a maximum of 200 gigalitres. You can pick a figure anywhere between them. At the request of the NSW Office of Water we are having a further third-party validation done that has not been completed. The preliminary report done by GHD is at the back of the notes we have provided. Hopefully, by the time we get that we will have a fair idea of how much water be will be saved or retained in the dams. Because it is not entitlement water it is hard to do a trade with the Commonwealth Government by saying that it can have the water for the environment and we will have the

$40 million. It is in the SDL basket and that is moving so slowly that I think we will all die wondering before they allocate particular amounts of water to the funds available. At this stage we are hoping to roll it out with the metering program and hopefully get it through the State priority projects system or through some other funding mechanism.

The Hon. STEVE WHAN: You talked about using the system for environmental water release modelling. Is that being picked up by the Commonwealth Environmental Water Holder or State Water?

Mr SMITH: It is being picked up by State Water but not by the Commonwealth Environmental Water Holder. I think they are starting to understand the complexity of the task that they have taken on. They will be looking for tools to better manage the situation. However, the actual operation falls back to State Water anyway. It is a strong supporter of getting in CARM to provide a better tool to operate the system.

The Hon. STEVE WHAN: I will provide you with an opportunity to give yourselves a plug. Why should Water for Rivers be retained to do that work rather than have the State authorities do it?

Mr BULL: We have the expertise. John Skinner did a presentation at a conference in Mildura several years ago and he spoke about river management and the possibilities. We have a discrete little team of people who are very good at what they do. They have developed this project up to this point. We also have a very good understanding of and relationship with State Water.

The Hon. MICK VEITCH: The terms of reference ask the Committee to look at methods of managing water storages and water flows and rivers used in international or other jurisdictions. Are you aware of any best practice or innovative models that the Committee could examine?

Mr SKINNER: We found it very difficult to find one. There are several in their infancy. There are a couple in the United Kingdom, and one on the Thames in particular. The one we earmarked as the closest to what we are trying to achieve on the Murrumbidgee River is in South Africa on the Orange River and the Great Fish River systems. They have a very delicate balance of river delivery to meet customer demand. They also have a very complex EC conductivity/salt problem at the mouth that they must manage with flows. That was the closest we could find. We virtually started from scratch to build something that suited our needs. The modelling is one small component of river management. Wiring in and plumbing all the back ends of the data sets were the biggest challenges. We have data sets from the Bureau of Meteorology, the NSW Office of Water and customers. We have customer orders in there as well and we have regulators and storages to manage. It is an extremely complex beast to deal with.

The Hon. MICK VEITCH: We heard this morning from Tumut Shire Council and the Riverina Eastern Regional Organisation of Councils about some issues that arose because of the flooding events in March 2012 and a couple of years ago. What are some of the lessons that we can learn from those flood events, and particularly the March 2012 event on the Murrumbidgee River?

Mr BULL: Dam operation is difficult because each dam has its own constitution. Some dams are built for irrigation, some are built for irrigation and flood mitigation and some are built for goodness knows what else. The river operator is on a hiding to nothing. The users of the water, whether they are irrigators, towns, cities or South Australians, want suitable levels retained in the dams so that water is available for distribution. On the other hand, they must be able to foresee rain events between now and the end of the year. The last flood came out of a late February rain, which is almost unheard of and it will probably not happen again in our lifetime. Honestly, it is very difficult to do anything against floods. They are part of the natural system and they come and go. All planning and operations have to be based on what we can describe as normal years and normal weather events. We cannot do much planning for exceptional weather events.

Mr SKINNER: I will put my hydrologist hat on. As I said, CARM is a hydraulic model. Not only is it for water delivery but it also becomes a platform for sound water resource management. We have applied this in the catchments and tributaries, so we are better able to get early warning of what is happening. We are harnessing that for regulated rivers, but it is also an extremely valuable tool when there is a flood situation. They are now extending the hydraulic model beyond the dams to get a better idea of what is flowing into them. If there is an opportunity or an allowance for prerelease, they have the smarts to be able to make an informed decision. At the moment there are Bureau of Meteorology forecasts of rain and so on, but now they can get a real idea of the runoff and the impact downstream.

CHAIR: Mr Skinner, I am interested in your role as a hydrographer.

Mr SKINNER: I should not have mentioned that.

CHAIR: I refer to options for mid-river storage. Witnesses this morning said that they believe that there is a need for mid-river storage to reduce flows in the Tumut River during the summer months and also as a flood mitigation tool. Are there any options for a reasonably efficient mid-river storage facility that could alleviate some of the problems upstream?

Mr SKINNER: It comes down to dollars versus benefit ratios. I am sure there are opportunities. Several studies have been done in the past on the Murrumbidgee River, mainly with regard to regulated river storage to meet downstream demand. I am not sure how effective they would be in flood mitigation. However, I am sure that if enough dollars were thrown at it it would probably work, as would higher levy banks and so on. It is a very complex subject.

Mr SMITH: We believe that CARM would reduce to some degree the higher flows in the Tumut area through the summer months. The flow being released would be better matched to orders at particular destinations. The other part of that is that irrigators take their water when they have booked to take it and they take the amount they booked. That is also part of the deal. However, in doing that, most of the 200 gigalitres that we referred to or the 100 gigalitres modelled by the NSW Office of Water involves a reduction in higher summer flows and retaining that for release whenever, but probably in the winter months—which are the traditional flood months. In our view there is some direct benefit from CARM for those tight parts of the river.

CHAIR: Previous witnesses spoke about deepwater weirs as a flood mitigation tool. That involves installing a series of weirs along the river which would be held at a low level normally but which would be able to collect water as the flood is increasing. Do you have any views about that?

Mr SKINNER: No. They would need to be significant weirs. A structure in the river is going to have its own impacts on upstream levels anyway. When we talk about the significance of the floods down the Murrumbidgee, it would take a very large storage to have an impact. They are the sorts of studies that would need to be done.

The Hon. Dr PETER PHELPS: In relation to the implementation of CARM across the State, how much would it cost to do all regulated rivers?

Mr SMITH: Do you mean in the basin?

The Hon. Dr PETER PHELPS: Yes?

Mr SMITH: It would require $40 million.

The Hon. Dr PETER PHELPS: How quickly would that be able to be rolled out if it were given approval?

Mr BULL: Probably three years.

The Hon. Dr PETER PHELPS: On that basis, do you foresee any areas that you would consider are priority areas?

Mr BULL: We would concentrate first on the larger rivers: the Namoi and the Macquarie, to a lesser extent the Lachlan. The Lachlan does not end up in the Murrumbidgee unless it is in flood. It is a terminal river. There are quite a few terminal rivers in the northern basin, which would be a low priority.

The Hon. Dr PETER PHELPS: Three to four years?

Mr BULL: Yes.

The Hon. Dr PETER PHELPS: The Namoi and Macquarie?

Mr BULL: And the Gwydir of course.

Mr SKINNER: The secret is that we have developed a model, we have done all the plumbing and wiring out the back.

The Hon. Dr PETER PHELPS: So you have actually planned it out?

Mr SKINNER: Yes, but we have a working system now in the Murrumbidgee. If we were to roll out CARM, we would complement a hell of a lot of other water savings initiatives that are currently happening in New South Wales. CARM enhances just about every water saving initiative currently being funded.

The Hon. Dr PETER PHELPS: You make the point that 80 per cent of the water has been achieved through infrastructure projects. How sustainable is that into the future in the sense that you only get one Barren Box Swamp come along in your lifetime? How do you envisage that more broadly across the State?

Mr BULL: Our future is almost complete on our original projects. We achieved that over nine years. We had a whole raft of different projects that we achieved and improving on-farm irrigation, as I mentioned, stock and domestic schemes, redoing Lake Mokoan and Barren Box.

The Hon. Dr PETER PHELPS: Are you talking about small-scale infrastructure projects?

Mr BULL: Quite often they were small. We did golf clubs at Deniliquin and Jerilderie. Where else, John?

Mr SKINNER: Corowa, Howlong.

Mr BULL: They were only tens or hundreds of megalitres.

Mr SKINNER: They are extremely valuable projects and produced some magnificent social outcomes as well.

The Hon. Dr PETER PHELPS: It will have to be a lot of little things for the rest of the State rather than two or three grand designs, is that right? That is just my view.

Mr SKINNER: There are opportunities to rationalise some systems as well that will provide big licks of water. They are not projects that you can walk in one day and achieve that year. They take a long time in their planning. There is a lot of discussion to be held with landholders. But there are two or three out there. There are some very large stock and domestic schemes that we have done feasibilities on to date that we would dearly love to deliver. We have relationships with the people, but we have just run out of time and funds to deliver those.

Mr SMITH: Your point is quite correct. The majority of water we have is what we tend to term around the board table as rats and mice. That has been because we have been on the ground talking with proponents.

The Hon. Dr PETER PHELPS: That pretty much answers my next question. State Water's opinion is that basically there is nowhere left in New South Wales for large-scale catchment of an economically viable nature to be located. In other words, everything that was economically viable has been pinched in the last 150 years or so. Would that be your view as well?

Mr SMITH: Pretty much.

Mr SKINNER: Are we talking dams?

The Hon. Dr PETER PHELPS: Yes.

Mr SKINNER: There are a couple of dams in the north that I am not totally familiar with that would help with managing delivery—smaller dams.

The Hon. Dr PETER PHELPS: Where are they?

Mr SKINNER: In the Peel area. There are opportunities there. It is only a very small system, but it would help with the balancing act with a couple of tributaries.

Mr BULL: It runs into the Namoi system.

The Hon. Dr PETER PHELPS: And the upper reaches of the Namoi?

Mr SKINNER: Yes.

The Hon. Dr PETER PHELPS: You are jointly owned by New South Wales, Victoria and the Commonwealth governments. What is your future? If we were to decide to roll out CARM and you were to do it, what is your future given that Victoria and the Commonwealth are involved?

Mr BULL: Our future would lie with the New South Wales Government. We actually are a public company owned by three governments under the Corporations Act and that has enabled us to do a lot more things than if we were just a State-owned corporation or other government instrumentality. We would envisage a continuation would mean that two shareholders would drop out and New South Wales would continue. Obviously, there would be a rejig of the board because the other two board members represent their jurisdictions. The transmission is fairly elementary, if and when it occurs.

The Hon. Dr PETER PHELPS: Finally, I am going to give John the opportunity to answer this question because I liked it so much when I heard it the first time in Dalgety. Can you explain what you did at Forest Creek?

Mr SKINNER: Forest Creek came to mind when you mentioned some of the projects that are available. Forest Creek is an ephemeral's dream that comes off the Billabong. Originally it was delivering about 80,000 megalitres of water down there every year to provide approximately 800 megalitres of stock and domestic entitlement. We had negotiated with these people for quite some time, but everyone likes a creek frontage. During the height of the drought the Office of Water closed that system off.

The Hon. Dr PETER PHELPS: The entire system?

Mr SKINNER: That section of creek, yes. Because we had already had a feasibility design on the table, within hours of that call being made by the Office of Water they were ringing us to investigate this pipeline. Within six weeks most of that property, which is major shareholding—it is a huge property—something like 300 kilometres of poly pipe were laid, with 200 tanks and troughs. Now they have a fully functional stock and domestic system that uses a fraction of the water they previously used and they have a property that is far more productive than it ever was because they can use the full area rather than having stock along the creek frontage. That is a success story. There is no two ways about it. There is an opportunity to do a third phase of that creek, which takes a lot of planning and lot of time. You have to send the right signals to people, but you certainly do not fund infrastructure on that system.

The Hon. Dr PETER PHELPS: How much was saved?

Mr BULL: Thirty-six gigs.

Mr SKINNER: Thirty-six gigalitres of water just in that one function.

Mr BULL: A nice little project.

Mr SKINNER: There certainly would not be the same amount but there are probably similar proportions that could be saved by piping irrigation water straight off the Billabong rather than taking it off the Forest.

The Hon. PAUL GREEN: Your submission suggests that a whole-of-valley approach is the most effective way to undertake water recovery. Why is whole-of-valley approach better? What does it entail?

Mr SMITH: If I can look at the larger scale, it was that logic I suppose that gave us to challenge why are we not managing rivers. As all the members I am sure will readily recognise and agree, every time we turn on the television and someone is talking about irrigation we will see it pouring out in a channel somewhere. That is the stereotype irrigation. That is where everybody goes when they start looking for savings in irrigation. They go to the irrigation districts and start looking in those sorts of areas, whether it is New South Wales,

Victoria or wherever. We went there too, the same as everybody else. Then we thought, hang on, what about the downstream of the meter on farm? So we moved there also to get efficiencies on farm. We were looking at it in the totality of the valley and saying we are working on farm and in the channel system, hang on, what about this bit between the dam and the channels? That is the river. We are the only ones operating in that space, yet it has huge efficiency gains. That really has developed our total valley approach to it. Why? One leverages the other, as you could imagine. It is sort of like compounding interest, I suppose. If you have one part fixed and the other part is not, you are not getting full potential of your investment in the part that has been fixed up. If all the parts are fixed up, then you start to realise real synergies. As John mentioned, in a whole lot of other smaller projects, what you might call local projects, they start to get those benefits as well, if the type of matrix is there.

Mr BULL: When we did the Murrumbidgee there were a suite of other projects we did. As well as just putting in CARM we needed to tighten up the river. There are couple of appalling flood runners with no particular structures to control the water, including Old Man Creek. Part of the Murrumbidgee project identified all these places where we can run the river better and do it in conjunction with the CARM project.

The Hon. PAUL GREEN: We will be putting forward some recommendations. This is your opportunity: If you could write the recommendations for the inquiry, what would they be?

The Hon. Dr PETER PHELPS: Maintain water for rivers.

Mr SKINNER: That is number one.

Mr SMITH: No, it is not so much that. It is utilise CARM—Computer Aided River Management—to measure and manage the finite resource. It is our belief that we will find more water in there than even the modelling has demonstrated once they are starting to use it. It is okay, how can we refine this even more to get better control and better delivery? As well as being able to control how much is released, it is controlling to the postcode type of thing; delivering water to the postcode and that applies to all customers. When we talk about that, most people think of the irrigation department. We see the environment as a major customer. They need that accurate delivery also or, as some of our local governments and irrigators generally will say, and should say, a lot of water has been taken out of the consumptive pool to move into the environmental pool. We want to make sure that that water is used wisely and efficiently as we are expected to use the consumptive pool wisely and efficiently. I do not think that is an unreasonable position, whereas currently there is a view by many not close to the industry that, no, we will send this flood down to water an environmental site. There are lots of other ways to do that and flooding is one of them, and should not be discarded. But maybe it also is not the panacea.

The Hon. PAUL GREEN: Would your number one recommendation be to follow up on that $40 million funding?

Mr SMITH: Yes, and then reap the benefits from that.

Mr BULL: It really is the catalyst for proper water management. If you have not got the tools, you cannot do it. People can talk about growing the rivers, but can you imagine the gas or electricity industry, or even town water, operating under the 100-year-old system that rivers run under? We are just taking a giant step into the next century and saying this is the way we can run our rivers better, deliver the water where we want, when we want and it is going to be so big for the environment. If people are concerned about environmental watching and getting water to South Australia, what we need and how much, by having CARM you can do that. It is proving to be the catalyst to doing all these things.

The Hon. PAUL GREEN: One issue raised concerns trees in the river. Obviously, we are seeing erosion and earlier we saw pictures of massive trees falling into the river, thus having an impact. What are the advantages of leaving that tree there, apart from the obvious habitat advantages? What are the disadvantages of having massive trees left in our rivers? What are the sorts of impacts on the water moving around those trees? Can you explain some of the impacts of a fallen tree?

Mr SKINNER: I am not an ecologist and I will not pretend to be, but trees falling into rivers have happened for a long time. They do form part of the habitat. CARM managing a better management of the level in the river, rather than constant wetting and drying as the river level goes up and down, we would be a lot more precise in the release so hopefully keep a more constant level in the river. I am sure that helps with erosion. I am sure that will help with riparian vegetation as well.

The Hon. PAUL GREEN: I think the impact was that the tree causes currents, which obviously then come back in to erode the bank.

Mr SMITH: The biggest impact, as Mr Skinner is saying, causing undermining of trees and the banks is the rapidity of raising and lowering the level. It saturates the soil; take it away quickly and that soil flows out basically.

The Hon. PAUL GREEN: I guess I am getting to the other side of it. Rather than prevention and then cure, I am basically saying the tree is in there. Is it such a disadvantage that we should be getting those trees out of there in terms of flood redirections and the impacts of flooding like clogging the river in those situations?

Mr SKINNER: I do not believe they would be having a serious impact on flooding. That is my own unqualified view.

The Hon. PAUL GREEN: That is okay. I was interested in your opinion for that very reason.

CHAIR: We are out of time. Thank you for appearing before us today and for your comprehensive submission and some interesting information on the CARM project. Good luck with it.

Mr SMITH: Thank you.

CHAIR: If there are any questions you took on notice, we will check and if there are things that we need to follow up on, the secretariat will be in touch with you over the next few days. If you could get that information back to us within 21 days, that would be be appreciated.

(The witnesses withdrew)

DENIS JOHN TINKLER, Southern Riverina Irrigators, sworn and examined:

CHAIR: Thank you for appearing before us today. If at any stage during your evidence you consider that evidence you wish to give or documents you may wish to table should only be heard or seen by the Committee, please let us know to that effect and we will take that into consideration. Would you like to make a short opening statement?

Mr TINKLER: The short opening statement is that I am qualified in no other way than I have been an irrigation farmer for 45 years. I have had an interest in the agricultural politics or the irrigation politics. I was a foundation director of Murray Irrigation when that organisation was privatised as the water distribution agency for the Berriquin to Wakool section. I guess I am here to represent the people of that area and that is the Murray valley, the major irrigation districts of the Murray valley, so I will be limiting my comments, apart from some perhaps other general ones, to the Murray valley.

The Hon. PAUL GREEN: What do you believe are the main difficulties faced by irrigators in converting, transporting and storing water in New South Wales?

Mr TINKLER: From our perspective—I cannot speak for anyone else—I think one of the major difficulties facing us is the basin plan and the changes that that will bring about.

The Hon. PAUL GREEN: In what ways? Can you elaborate on that?

Mr TINKLER: Possibly the best way to describe it is to illustrate how our area actually works. So I will talk about system constraints there. We are obviously supplied by the Hume weir, with that wonderful storage at Dart. We are in that peculiar position of linking with Victoria and South Australia. I will not go into the details. As far as the distribution is concerned, the first system constraint is that one from Hume to Yarrawonga, and that is a simple system constraint—what I describe as simple, anyway, in that it is just basically river channel capacity. Once you get above a certain level of flow, about 25,000 megalitres a day, it starts to create over-bank issues and certainly once you get to 40,000 megalitres a day you get serious over-bank issues in that section.

At that point our water is diverted through the Mulwala canal. So that system constraint has been there for a long while and the basin plan will exacerbate the issues there. Although it does not affect our particular irrigation distribution, I would like to talk about the next system constraint because that has been a major one. That is called the Barmah choke. I think it is probably the most misunderstood system constraint in the whole system. I have to go back 20,000 years to explain it. Sorry, I have not got any maps or anything but if you know where Deniliquin is and you know where Echuca is, it is about 45 or 60 kilometres, something like that, between the two. I say 45 kilometres because there is a rock wall that is six metres high and 45 kilometres long. Some 20,000 years ago, or thereabouts, the plate moved. It is called the Cadel tilt. It lifted up. The Murray used to run roughly from Tocumwal to Swan Hill in very much a straight line and was a normal river. It ran within its banks unless it was flooding, and then it overflowed.

When the Cadel tilt occurred it blocked the Murray. It formed a huge swamp, which later became the Barmah Willawa forest. It initially forced the river to run to the north through the present Edwards. Later in some big flooding events it broke back to run to the south the present course of the Murray, which connected with the Goulburn because the river that had previously run from Shepparton to Echuca and on to Swan Hill was actually the Goulburn River. Some time, 10,000 years ago or something, the river forced its way back there. But in terms of system constraints, that six-metre high, 45 kilometre long rock wall is still there. I do not think any amount of computer modelling will change that. That is a serious constraint which will have effects on how the river flows. I think the management programs that have developed over the past 50 years since we have had all the major storages and the major changes to natural flow have really happened in the past 50 years or 60 years. They will all have to be rethought and that will have an impact on management of water storages.

The Hon. PAUL GREEN: Before I run out of time I would like to ask another simple question, as I did previously. If you were writing the recommendations for this inquiry what would you be putting in them?

Mr TINKLER: I just add there is an opportunity for an upstream storage in the Murray, which has strangely gone right out of favour and it is the Murray Gates project which is a storage upstream of Hume. I understand it is an ideal dam site. It is a three million megalitre storage but it has an annual yield of 300,000

megalitres. So while a lot of planning was done some 20 years ago, perhaps a little more, it generally fell off. It just went right off the radar. I am not recommending that as an irrigation storage at all. In fact, I think it would have a deleterious effect on irrigation possibly, only minor. But it appears to me that if you are going to build storages you build them as high up the hill as you can and have them in a spot where the water is as deep as it can possibly be. That is common sense.

That is one storage that does it. If you want to drought proof, humans need water for the long term. It seems that this one should be back on the agenda as at least being considered. The other recommendation that probably should come out, apart from the one that is in here about looking at the Ovens—and, once again, I would say the basin plan has turned everything upside down. I reckon we had a good system. I cannot see it in the basin plan. But if that is going to happen, you have to start looking at other alternatives. The Ovens is another one. The other one is that down river there may be opportunities. I do not know where they exist but as an example Lake Victoria as a re-regulating storage is particularly effective in re-regulating and keeping the right flows going into South Australia. But at the same time I think it is in excess of 100,000 megalitres of evaporation from Lake Victoria so there must always be a balance in those things.

When you get downstream and when you consider the various system constraints, it may well be that there are some real management advantages in having some storages downstream that can give pulse flows. To use theoretical figures, if it takes 50,000 megalitres a day to achieve a certain thing at a certain point in the river, but just upstream of there it may not be possible to get 50,000 megalitres a day past it, you may be able to have 10,000 megalitres sitting here so that you can take 40,000 and for one day you can—the numbers do not work right but you understand the principle that you can actually increase flows to achieve an outcome. They are the sorts the things that I think should be looked at. I am not a technical person so I cannot provide specific examples. However, that is the general principle.

The Hon. Dr PETER PHELPS: Page 7 of your submission states:

> …many inefficiencies occur with some of the rules that apply at a Government level.

The Committee must make recommendations and members would like to know what you see as a problem so that we can suggest changes.

Mr TINKLER: I did not write the submission. However, when I read it this morning I kept writing "basin plan" in the margin. I kept thinking that with the changes that will happen with the basin plan we need to keep an eye on—

The Hon. Dr PETER PHELPS: You can take the question on notice. I would like you to flesh out some of the inefficiencies in a little more detail. What are the inefficiencies that you think have this effect?

Mr TINKLER: I will take that question on notice.

The Hon. Dr PETER PHELPS: Water licensing issues have been raised in a number of submissions to the inquiry. Does your group have any comments about current water licensing practices in New South Wales?

Mr TINKLER: The water licensing issue in our part of the State has been settled for close to 40 years. Unless someone changes the rules we are fairly comfortable with water licensing as it stands. Once again, I refer to the basin plan. There is always a risk that water can be given a different priority. It is essential to us that when the environmental sector purchases water from Denis Tinkler that that water retains exactly the same terms. I am not sure that that is what you are looking for, but it is important to us.

The Hon. Dr PETER PHELPS: I refer to your comments about the Barmah Choke. I take it that you are not suggesting that engineering works be undertaken to—

Mr TINKLER: Indeed, I am not suggesting an engineering solution.

The Hon. Dr PETER PHELPS: I thought perhaps the United States Army Corps of Engineers might read this transcript and decide to tender its services to recreate the river in a new and more exciting form. How do you see efficient environmental flows being undertaken?

Mr TINKLER: That is the very big question. My personal opinion, and I think most of my fellow irrigators would agree—

The Hon. Dr PETER PHELPS: Everybody knows you can have inefficient and ineffective environmental flows, but how do you get something that is both effective and efficient?

Mr TINKLER: That probably requires the wisdom of Solomon. Works can definitely be done to improve the efficiency of environmental flows. I cannot say anything else. The previous witnesses have the technical knowledge to improve the efficiencies.

The Hon. Dr PETER PHELPS: I will ask the Dorothea Mackellar question about droughts and flooding rains. Do you feel you have enough security over your water to operate in a situation of—

Mr TINKLER: I think I can answer this question. There is always a play-off between security and yield. It is does not matter what failures you look at, if you want ultimate security you will get much less yield. If we wanted every irrigator to get 100 per cent security—which means that through the previous drought they got 100 per cent of their allocation—they would probably have to give up 80 per cent of their water. Critical human needs always come first; riparian flows always come ahead of irrigation. We must remember that in five years out of 100 on the Murray River we will have serious problems regardless of the number of storage facilities. We made that decision probably 20 years ago in discussions with the department. We were comfortable to have the security we had to give us the extra yield in the years when it was available. I believe even the late Professor Peter Cullen agreed that that was the appropriate way to manage rivers for irrigation.

The Hon. Dr PETER PHELPS: If there is a small inevitability, why would we spend money on a Murray gates project?

Mr TINKLER: It certainly would not be for irrigation. I am not recommending that you do it, but it needs to be in your thoughts. If critical human needs are of the utmost importance—and I think they are—then perhaps a storage that does not stack up in terms of cost benefit might have an intangible value. When it comes to critical human needs there is an intangible that we cannot give a dollars and cents value. I am not recommending that we build it, but it should be considered in terms of critical human needs.

The Hon. MICK VEITCH: As we have been travelling around the State we have been hearing differing views about how the water flows have been managed. It was a particular issue as we moved toward the irrigators in the flatter country. What has that been like in your catchment? Have there been any issues with the way the water flows are being managed?

Mr TINKLER: As I said, we are above the Barmah Choke. Our constraint has been from Hume to Yarrawonga. That has required some management. At times the level of Lake Mulwala is an issue. For instance, when the boat races are being held they require a certain water level and it sometimes coincides with peak demand from rice growers. That creates some conflict. There was a problem on one occasion, but I think it was a settling-in issue when Dartmouth Dam first came on stream in the late 1970s. The water had not been let out of the Dartmouth Dam and we did not have enough water in the Hume Dam.

The Hon. MICK VEITCH: But in the main it has been very good?

Mr TINKLER: Yes, in the main the management has been quite good.

The Hon. MICK VEITCH: Your submission talks about wanting flexibility with minimum release flows.

Mr TINKLER: That relates to Snowy River releases. That is a commonsense issue. To have 1,062 gigalitres being released every year, no matter what, and to tip water into an already full Hume Dam—there is only one place it can go—is a little illogical if there is potential to retain the storage. I have not been close enough to it over the past 10 years to have followed everything. However, I believe there has been a move towards some changes. We do not want to see the 1,062 gigalitres reduced, but it could be run as a long-term rolling average. If the Hume Dam is full and only 800 gigalitres can be dropped in one season, so be it. We could catch up the other 262 gigalitres over the next couple of years or whenever. We need to apply commonsense to those rules.

The Hon. MICK VEITCH: I refer to on-farm efficiencies and the programs being run. What is your experience with them?

Mr TINKLER: I have done one project. I am happy with the dollars and cents arrangements. We did a project involving land forming and a flood irrigation system.

The Hon. MICK VEITCH: When did you do that?

Mr TINKLER: We completed it last summer.

The Hon. MICK VEITCH: So you have not had a chance to see whether it worked?

Mr TINKLER: It has worked marvellously. We are happy with the arrangement even though it went over budget.

The Hon. Dr PETER PHELPS: Does it involve bankless channels?

Mr TINKLER: No, it is a border check system. We call it automatic, but it simply involves timers with rubber flap technology. The bay outlets are totally sealed and we have portable timers that we shift from one to the other. It cuts the labour content by 50 per cent or more and cuts water usage by about 20 per cent because you have better control.

The Hon. MICK VEITCH: Do you see a role for these on-farm generated efficiencies, particularly with government funding?

Mr TINKLER: Yes, but relative to the local soil types and land use. Obviously you do not put in micro irrigation to water wheat. In our case, referring back to security versus yield, we are in a situation where we know five years out of 100 that we will not be irrigating. You do not spend a lot of money on something that will be used only occasionally, even if occasionally is 80 per cent of the time.

The Hon. MICK VEITCH: Do you envisage participating in another round of on-farm efficiencies?

Mr TINKLER: I have two different farms. I have done it on one farm and I am going to do it on the other farm, but to a lesser extent because the other farm was already developed and did not have as much opportunity. As time goes by and as water availability decreases there will be decreasing potential. There is certainly still plenty of potential.

The Hon. STEVE WHAN: I note that your submission refers to augmenting current storages, adding interval storages and maximising the use of existing storages. What are the interval storages?

Mr TINKLER: That is something downstream that can be done as reregulation.

The Hon. STEVE WHAN: Downstream of the choke?

Mr TINKLER: Downstream of the Hume Dam, but that really does mean downstream of the choke. We already have Lake Mulwala. There is only about a foot that you can do much with because the Victorian side is high. If you drop one in the Mulwala you cannot get much water out of the Victorian side.

The Hon. STEVE WHAN: If you put it above the choke you would not be able to get any more through.

Mr TINKLER: That is true.

The Hon. STEVE WHAN: Earlier witnesses talked about wanting to see dams in the top end of the system—albeit not on your part of the system—for flood mitigation. Does your organisation have a view on that? They are advocating an air space being kept in a dam for flood mitigation.

Mr TINKLER: I am going to have to come back to the basin plan again, I am afraid, because we already are seeing that the Commonwealth Environmental Water Holder is holding considerable amounts of water. We do not know what is going to happen in the future, but at the moment it certainly indicates that more

dam space is being used to hold environmental water plus the fact that we as irrigators want to hold our water there. I think as far as Dartmouth is concerned there would be no opportunity; you would not want to see any changes up there. As far as the Hume is concerned, it has operated damn well in the past under the existing regime anyway by the simple fact that the irrigators use the water. Always remember that the storage dams do not actually have much flood manipulation effect.

The Hon. Dr PETER PHELPS: I think the question is should they?

Mr TINKLER: This actually came from a former senior department bloke yesterday to whom I was talking. He said it does not really matter what you do, it virtually has no effect on the big floods and it takes a bit off the smaller floods. But what you can effectively do is very limited unless you are going to use them just as flood mitigation storages. If you have 200,000 megs a day coming into a storage and you have allowed 200,000 megs of free board there, that is one day. It does not make a lot of difference.

The Hon. Dr PETER PHELPS: It does not just rain over dams.

Mr TINKLER: No, it does not.

The Hon. Dr PETER PHELPS: Do your members have any concerns over the future of the Hume Dam or any likely safety improvements?

Mr TINKLER: I was at a meeting that David Dreverman was at recently where he outlined the work that was being done there at the moment. My question to him was: does that make it safe in an 1870 flood, which is the biggest recorded flood. His reply was something along the lines that it will make it safe in a flood 10 times that size. I guess while we argue over the dollars and who should be paying, we have no argument over the safety work. We are quite pleased with it.

CHAIR: Thank you for coming along. You did take some questions on notice. The secretariat will be in contact with you about those items. When you receive that notification we would appreciate if you could get that information back to us within 21 days.

Mr TINKLER: Will do.

CHAIR: Thank you very much for attending.

Mr TINKLER: Thank you.

(The witness withdrew)

TERRENCE NOEL HOGAN, Chair, Riverina and Murray Regional Organisation of Councils, and Mayor, Jerilderie Shire Council, and

RAYMOND OSCAR STUBBS, Executive Officer, Riverina and Murray Regional Organisation of Councils, sworn and examined:

CHAIR: Welcome gentlemen. If at any stage during your evidence you consider that certain evidence you may wish to give or any documents you wish to table should be heard or seen only by the Committee, please advise us and we will consider that request. Would either or both of you like to make a short opening statement?

Mr HOGAN: I would like to do that on behalf of Ray and myself. Thank you. We welcome the opportunity to provide input to today's inquiry hearing. RAMROC represents the interests of 18 member councils covering the lower Lachlan, Murrumbidgee, Murray and lower Murray-Darling River catchments. The region covers an area of about 127,000 square kilometres and has a regional population of 168,000 people. Water is the lifeblood and main economic driver of the RAMROC region for agriculture industries and jobs as well as our towns and communities. RAMROC agricultural region includes the Murray, Murrumbidgee, Lachlan and Coleambally irrigation areas as well as a large number of small irrigation entities and private diverters. Agricultural production in the region is worth over some $2 billion at the farm gate and, of course, many times more through value adding. Agriculture employs some 30,000 directly with a further 17,000 jobs in processing and other industry-related businesses.

To give you a bit of a feeling, in northern Australia some 500,000 gigalitres of annual rainfall is largely unused and flows into the sea. Only an average of 22,000 gigalitres flows into the Murray-Darling Basin, of which only 50 per cent is used for irrigated agriculture. Over 100 years ago out political leaders had the foresight to realise that in order for Australia to grow and prosper west of the Great Dividing Range effective water conservation was essential to droughtproof the land. Before that time, history clearly shows that the inland rivers often ran dry, and sometimes were no more than pools of muddy water. The commencement of Burrinjuck Dam in 1907 began an era of nation building water conservation projects and irrigated agriculture. Since then construction of storages such as Blowering, Wyangala, Hume and Dartmouth dams and, of course, the Snowy Mountains scheme have provided our nation with magnificent benefits in food production, fibre, fruit, wine and associated industries, electricity generation, regular well-managed environmental flows and asset protection, healthy rivers and sound ecological systems, reliability of water availability for urban and rural water supplies, industries, recreation and tourism, security of water for the urban and agricultural needs of South Australia and Adelaide urban supply, flood management and drought relief strategies as required.

These great benefits and advantages have diminished over the past 35 to 40 years. The construction of additional water storages has come to a virtual halt, mostly due to unfounded and often extremist environmental representations coupled with a lack of political strength and nation building leadership. The proposed Murray-Darling Basin Plan is intended by the Federal Government to remove some 4,000 gigalitres of water from irrigated food and fibre production and divert it for use as increased environmental watering. This absolutely emphasises the environment and, given time, will prove to be disastrous not only for the impacts on Australia's economy, food production and long-term food security, but also will destroy many rural towns and communities, particularly in terms of investor confidence, property values, loss of processing, warehousing and transport industries, downturn in local businesses and services, and adverse impacts on economic and social wellbeing.

The time has come for water solutions to be found. Australia no longer can afford to continue to stagnate. Water is the key to our future and the current situation of the Murray-Darling Basin Plan must now be a catalyst for a far greater harnessing of storage of our precious water resources by way of new water storages and/or diversion schemes from northern Australia and/or coastal river systems, by innovation technology research and development, and by the ongoing development of effective river and irrigation management systems. We at RAMROC are not political or technical experts; we cannot provide the solutions to you. We recognise that a great deal of work needs to be done to achieve the critical outcomes required for our nation's future. We can remind the future planners and decision-makers that this issue is not new. Humanity has faced this problem since time began. As our populations have grown, so has the need for water. We seemed to have overlooked a very fundamental principle, that is, humanity cannot survive without water. When we speak of water the recognition must be that food production requires enormous amounts of water. We look forward to

discussing these issues and matters raised in the RAMROC submission with members of the standing committee.

CHAIR: Mr Stubbs, is there anything you would like to say?

Mr STUBBS: Nothing further to add.

The Hon. STEVE WHAN: I want to give you the opportunity to respond to a question I asked of previous witnesses today, including those from Tumut Shire Council, about the capacity of dams for flood mitigation, for example, airspace. You both are shaking your heads vigorously. I give you the opportunity now to place your view on the record.

Mr HOGAN: I am delighted to be asked the question. I guess as history shows, and this is not new, in a normal and average year, and I guess we sort of are wondering what they might be too lately, with a snow melt and no dams at all, I do not know how many years out of 10 that valley was flooded, but it would have been fairly regular. With the implementation of Blowering Dam and other dams—those rich river valleys do not get the annual flooding they would have had in the past—we have become quite destructive. Whilst they might be not happy with the high river flows they currently get through irrigation and now with environmental flows, it is something that we as a society have to wear for the advantages of water storages.

The Hon. STEVE WHAN: I note that a couple of councils are common to both REROC and RAMROC and have quite different positions on that. How do you resolve that?

Mr HOGAN: In ours you might be referring to REROC?

The Hon. STEVE WHAN: Yes.

Mr HOGAN: No, we do not have them in our group.

The Hon. STEVE WHAN: The REROC has a couple of councils, Greater Hume—

Mr STUBBS: Was it Greater Hume?

The Hon. STEVE WHAN: No. It is a member of REROC as well as RAMROC.

Mr HOGAN: Yes, they are.

The Hon. STEVE WHAN: Some strong differences have been taken. How are you resolving those differences with those councils or are they things they are not concerned about?

Mr STUBBS: The three councils are Greater Hume Shire, which is to the north and west a little bit of the city of Albury; Corowa, which is on the Murray River system; and Urana, which is mostly dry land area with a small amount of irrigated production. I would be surprised—I have not seen the REROC submission; I do not think there was a written submission that I was aware of—if there was any disagreement from Greater Hume, Corowa or Urana in relation to our submission. All of our councils very much support all of the things that we have done and representations we have made about the Murray-Darling Basin Plan, for example.

The Hon. STEVE WHAN: In your opening statement you talked about there not having been new water storages built. We have had a number of representations and discussions today about on-stream and smaller or deep water weirs and so on. Do you have a view on areas that would be suitable for more storages?

Mr HOGAN: I think history shows higher up in the catchments; you have less evaporation. We see some of the problems on the Darling with the water storages in very hot, shallow catchments and I think we as a society are paying for that. We are not getting the return we should out of the water that could be stored and used, both for the environment and food and fibre production, if those storages were back in our upper catchments.

The Hon. MICK VEITCH: One of things that Tumut spoke about in their presentation earlier today was that they acknowledge there are competing complexities about their needs in the upper catchment with the releases out of the Tumut River and the needs down in the irrigation country. They acknowledge that there are

competing complexities. What is communication like among the stakeholders along the length of the river, from your experience? Does it need improving? We have to acknowledge each other's issues and then find a way through those together.

Mr HOGAN: We have sort of had those issues and discussions for a very long time. They did not raise their head in the last 10 to 12 years because we went through probably the worst drought in recorded history. It is only when you obviously get years like we have had in the last two or three years that those issues raise their ugly heads again. It is a trade-off and I am reminded that of all the water that falls on this magnificent land of ours only 6.2 per cent of run-off is in our Murray-Darling Basin. It would be lovely to be able to have a structure that would take that angst away from those communities but facing reality we cannot afford them.

The Hon. MICK VEITCH: The March 2012 flood event was a pretty significant flood event. What are some of the lessons that we can all learn from that and what are some of the things that you think the Committee should take on board emanating from that significant flooding?

Mr HOGAN: Probably some more storages. Sorry, it was an easy one. I think it is. If it is climate change or serious climate variation, whatever ticket you want to carry, those opportunities come and I think we as a society, if we are going to try to meet the global challenge, and that is to feed—we have seven billion people on the planet; the prediction is 10 billion by 2050. The challenge for me as a farmer is to double my food production. One of them is less water. The planet still has the same amount of water on it; it has not disappeared. It is just not raining in our catchments. It is raining out to sea. So I have less nutrients in my soils. Fertilisers will become more expensive. I think the phosphate fertilisers that farmers will have to use to try to double their food production—I think I have seen figures that production is supposed to peak in about 2033 and then decline pretty rapidly. We know what is happening to oil. Nitrogenous fertilisers will become more expensive. So it is not just a New South Wales issue or a national issue; I see it as a bigger issue. I do not know whether that answers your question.

The Hon. MICK VEITCH: With the time I have left, I turn to urban water supply, your town water supplies and specifically within RAMROC. Are you aware of any of your constituent councils, member councils, that are undertaking water harvesting programs or stormwater reuse or anything like that?

Mr STUBBS: Over the years Albury City Council has done quite a lot of work about water management. I used to be at Albury City Council before I originally retired. So they have certainly done some. A number of councils have done their integrated water cycle management plans and coupled with that in expectation of the climate change and shortage of water RAMROC did secure some funding through Penny Wong's department originally, under the Strengthening Basin Communities program, to look at opportunities for better management of water and water harvesting within their local areas. That program is just coming to a halt now. We split RAMROC region into four areas: the upper Murray area, the central Murray area, the western Murray area right down to Wentworth, and the western Riverina area, Griffith and Leeton. Four cluster groups work individually in respect of their own areas. As I said, those are coming to a halt. I think in the cluster one area, which is Albury city, Greater Hume, Urana and Corowa shire, they have identified some water saving projects which they now need to try to get some funding for under stage two. Unfortunately I do not remember the exact technical projects that they have identified but I think from memory they identified about eight to 10 projects.

The Hon. MICK VEITCH: Are they efficient and effective programs? Are they delivering what was originally planned?

Mr STUBBS: I think they are good programs but in the sum total of them they would not add up to a whole amount of water—not a large amount.

The Hon. MICK VEITCH: I want to ask a question about modelling. One of the terms of reference talks about the modelling that is being used to determine the adequacy of our water storages to meet the needs of a number of stakeholders. Does RAMROC have any views about the modelling techniques that are used and the data collection processes that underpin that modelling?

Mr STUBBS: No, not from a technical point of order, and we do not have the expertise to do that.

CHAIR: I take you back to the issue of water storages. Do you see that there is anything to be gained by embedding storages further downstream to try to reduce the upstream flow in some of those rivers during peak demand periods?

Mr HOGAN: The only reason you would do that—we live in a hot and dry climate and the further down you get onto the plains the more you will run into those issues—would be if there was a flush like a spring flush or something and you were able to capture that and then draw off that immediately, either into the environment or into irrigated agriculture producing food and fibre. As I said, we see the examples of the problems that face the lower Darling and the enormous evaporation that takes place there. I think there was a scheme—I cannot remember the scheme—in around Narrandera.

CHAIR: Yes, there was, Lake Midgeon.

Mr HOGAN: That is it. That must be 50 years ago or something I think that was floated. But that would only work if you had a serious channel structure. I know they have looked at Lake Midgeon as recently as five or six years ago. The energy and the pumps that you would require to shift that amount of water out of a flood event, it would be humungous. I do not know what that does to the carbon footprint. Trying to get a huge channel structure that would handle a big flood like that, to be able to suck that off, and go through properties, I think we would run into too many endangered species.

CHAIR: You run into too many problems.

The Hon. Dr PETER PHELPS: In your region of councils, are there any areas where you believe, I take it no new storages, but the existing storages could be augmented?

Mr HOGAN: No, nothing that comes to mind immediately.

The Hon. Dr PETER PHELPS: You do not have a spare Barren Box Swamp hiding anywhere?

Mr HOGAN: No. Dick did well with that. We wish we did but, no, nothing obvious.

Mr STUBBS: I think once, quite a few years ago, there was a local engineer in Wodonga who mooted some additional water storage upstream of the Bethanga Bridge on Lake Hume, which was going to augment Lake Hume, which is about 3,000 gigalitres at the present time. But it was one of those ideas from engineering people that was being floated. I think the whole thrust of what our submission has been to here and other areas is that the Murray-Darling Basin plan will remove a lot of water from food and fibre production. The Murray-Darling Basin Authority is only looking at one side of the thing of saying, "How do we manage the water that we have at the present time?" There is not any thought at a national level, big vision picture, as to how we can solve that problem.

Do we just look at the problem or do we start to look at the solutions? So the thrust of our submission basically is that we think the Commonwealth Government and the States—that is, Queensland, New South Wales, Victoria and South Australia—it is time now to say, "Let's look at the big picture of everything." We would have a Murray Gates Dam or a Chowilla Dam down near South Australia where a lot of the problems are and a lot of the evaporation. We are not trying to say this is where they should be, but we are saying, for heaven's sake, for our nature and the future of our nation 50 years down the track we need to start looking for some solutions, rather than just dealing with problems.

CHAIR: Is not the role of the Murray-Darling Basin Authority supposed to be just that?

Mr STUBBS: When we said that to the Murray-Darling Basin Authority the response was, "It's not in our charter to look at that. We were told to prepare a Murray-Darling Basic plan in accordance with the Act."

Mr HOGAN: You would think there would be a 50-year plan that would look at all those issues. Unfortunately there is not. In trying to answer your question, Coleambally is a fairly recent irrigation scheme. It was placed on a very large underground aquifer. I only found that out after I felt the thing on top. People have looked at ways of accessing sand beds and being able to feed them to get water back in and replenish some of those things.

The Hon. Dr PETER PHELPS: The recharging.

Mr HOGAN: Yes, the recharging issue, but I do not know. You probably need a couple of thousand hectares of sand or something to be able to get a pulse that is coming down the river like a major flood, grab that and put it into that sort of storage.

The Hon. Dr PETER PHELPS: Your submission talks about diverting surplus water resources from the northern States and/or from coastal regions of New South Wales. I am a little intrigued by that. Can you elaborate?

Mr HOGAN: You would not be on your own.

The Hon. Dr PETER PHELPS: Are we reviving the upper Clarence scheme or Bradfield?

Mr HOGAN: You have to throw the hand grenade in the ring.

Mr STUBBS: With regard to Shoalhaven, the Tallowa Pipeline Company, which we referred to in our submission, has briefed us about its proposal. It has been undertaking investigations over a long period and it believes that it can tap surplus flows that in its view are being wasted. That involves a couple of hundred gigalitres a year and moving it into the Murrumbidgee and Lachlan systems. Again, we are not experts, but all of these schemes—be it there or on the Clarence River—should be examined. I know that the Tallowa Pipeline Company has not been able to get to the political level. It is consistently told at the bureaucratic level that diversion of coastal river schemes is neither economically nor environmentally acceptable. It is saying that if it has sound business proposals that can generate money for the New South Wales State Government they should be given more consideration.

The Hon. Dr PETER PHELPS: Can you appreciate Tumut Shire Council's gripe that it is being washed away to allow water flows to people who are not really paying the price for what those flows are doing? Can you see why they would be unhappy with the existing arrangements?

Mr STUBBS: I think I can. I have always assumed that the Murray gates project was designed to control the releases that came out of the Snowy Mountains. Whether that would solve their problem I do not know. However, we can appreciate their problem.

Mr HOGAN: We certainly appreciate their problem. However, again it is the trade-off for not only New South Wales but also Australia.

The Hon. MICK VEITCH: To be fair, they did not say you could not have the water. They just want a better way to deliver the water so that it mitigates the impact on them. Their issue is the fast, cold flow of water as opposed to having storage further down that could accommodate better management and reduce the burden on their water infrastructure.

Mr HOGAN: When I was a member of the Murrumbidgee River Management Board the State Government spent a lot of money trying to maintain the banks on the Tumut River. However, that was like pouring money down a black hole.

The Hon. MICK VEITCH: It just kept going.

Mr HOGAN: Yes.

The Hon. Dr PETER PHELPS: The photographs indicated that it has not been successful.

The Hon. MICK VEITCH: Do not ask any questions about the Shoalhaven.

The Hon. PAUL GREEN: I will not ask any questions about the Shoalhaven. I merely state that the environmental flows are designed to save the fishing and oyster industries and they are incredibly important. Taking the extra for a short-term gain would certainly cause long-term pain for other industries. My question relates to local government given that scenario of appreciating the value of water for local government areas to build the economy. One witness talked about councils purchasing high-security water to attract businesses so that their towns do not shrink. Do you have a view about that?

Mr HOGAN: Towns and cities have a high-security allocation, but it has a limit. Of course, there is a limit to all the categories, whether it be general-security or high-security water. If you want to encourage industry that needs high-security water you have to go to the marketplace to buy it, and it is not cheap. There is some opportunity to do that. However, there is not an extra pool sitting somewhere; it is a finite amount at the moment. If you want some, you have to buy it. If it was an industry that could afford and needed high-security water you would go into the marketplace and buy it.

Mr STUBBS: When I was in Albury the entitlement was about 13,000 megalitres a year. From time to time we were getting close to that annually. Through a series of conservation measures, not the least metering of the city—when I went there they had removed the meters, but they were replaced—and other water saving measures the general average usage is now about 7,000 megalitres to 8,000 megalitres as against 13,000 megalitres. The paper mill had a special licence and pumped directly from the river. Part of the strategy was to have that bank of water available within its entitlement to cater for new industry growth. Eventually, if we have a whole lot of industry in the city, they may have to buy some water. However, at the moment they have some capacity.

When we were in the critical water stage during the middle of the drought we had a critical water group chaired by David Harris. One of the big things we were trying to manage was the question of water restrictions going from stage 1 to stage 4, which was the most serious stage. That meant no external watering at all. Many councils said they had some issues with schools, playgrounds and sporting fields and trying to keep a green area alive. In fact, most of our councils in the Murrumbidgee put their hand in their pocket to buy water to move from stage 4 to stage 3 so that they could at least do some controlled external watering.

The Hon. Dr PETER PHELPS: Did they truck it in?

Mr STUBBS: I know it sounds funny. However, having bought it, it was available for them to use. It probably was not a large amount.

Mr HOGAN: Two examples are the piggery at Corowa and the feedlot at Yanco at the height of the drought. Because of the number of jobs involved there was a big push for them to get into the high-security market to purchase water to keep their operations going.

The Hon. PAUL GREEN: I thought it was an interesting point given the financial sustainability of some councils, particularly smaller ones, for them to buy water at that level to ensure supply for business growth. Water licensing has been raised in a number of submissions, including in the New South Wales Government submission. Do you have any comments about the current water licence practices utilised in New South Wales?

Mr HOGAN: No.

Mr STUBBS: No.

Mr HOGAN: I think they are pretty well tied up. What issues were raised?

The Hon. PAUL GREEN: I was hoping you would be aware of them. I have been asking witnesses what they would recommend if they were writing the Committee's report. What would you recommend?

Mr STUBBS: As I said, I think the time has come in this nation for governments at all levels—Commonwealth, State and, where appropriate, local government—to sit down and determine how we will develop a national water plan. What are our overall national resources? Are we using them effectively? If not, what can be done? What are the economic and environmental consequences of trying to better manage with the Prime Minister's objective that we be the food bowl of the world, and of Asia in particular? We cannot do that if we do not have water to grow food. We can do research and development, but water is essential for Australia to be a food producing nation.

Mr HOGAN: Without water you do not have humanity. I support what Mr Stubbs said. We need a national plan that is fully integrated throughout the system out to 50 years. We have a Murray-Darling Basin plan that goes from month to month at the moment. That is a real blight on our nation's future. It is short-term, shallow planning. We need and deserve better than that.

The Hon. PAUL GREEN: It is surprising given the role that water plays. The Committee was at Orange a couple of days ago and it was good to see its 50-year plan. They know where they are heading in terms of demand management strategies. The fact that we do not have that at the national level is incredible. This Committee will continue to apply pressure in that regard. Your submission mentions the need for innovative solutions to generate additional water resources in the southern basin. What could those solutions be and what will be the impact on the productive capacity of the region?

The Hon. Dr PETER PHELPS: Apart from the Shoalhaven project, which is now officially off the agenda.

Mr HOGAN: That will be included in the 50-year plan, but do not tell him.

Mr STUBBS: Apart from the Shoalhaven project. I cannot argue their case for balance. That is probably best done by them. Certainly, innovative solutions involve looking at the big picture, whether that is water diversion, water storages or other means, better management, Water for Rivers or CARM-type projects. All of those innovative things should be fostered and nurtured to see if we have some better solutions. I do not think we can simply say that we do not have enough water in our nation. We must look after our environmental assets, but we also need to look after the economic and social wellbeing of our communities and food and fibre production. After all, we are just one nation.

Mr HOGAN: It is all about research and development. I read an article the other day that stated that the world—both the private and public sectors—spends $50 billion on developing new plants and species for agriculture and $1,600 billion to find new ways to destroy ourselves. That must be reversed if we are to meet the challenge of doubling our food production on this planet in the next 50 years. It is not only a New South Wales thing; it is bigger than all of us.

The Hon. PAUL GREEN: When we travelled to Orange we saw all the crops falling off the trees because of a lack of demand. It does not make a lot of sense that we are the food bowl but food wastage is incredibly high for various reasons. It is not only about addressing the water issue because obviously the product is there. The global markets are obviously applying pressure.

Mr HOGAN: I keep harping about it and people have heard me on this topic before. I do a very simple breakfast to illustrate how much water is used. This morning when you got out of bed if you decided to have a glass of milk or a glass of orange juice—not a litre—you consumed 200 litres of water. If you decided to have an egg—boiled, fried or poached—you would have consumed 135 litres of water. If you then had two pieces of dry toast—without butter—each slice would have cost 40 litres of water. If that was washed down by a cup of coffee, you would have consumed another 140 litres. You would have effectively used well over half a tonne of water eating that very modest breakfast. While we will not see it—I certainly will not see it in my lifetime but my grandchildren might—it will become increasingly important for not only this country but also the entire planet to produce food using good, clean water.

The Hon. PAUL GREEN: I appreciate how you present that. Certainly, our water directors said we get a trailer full of water for $1.50 to our tap. It does not get much better than that. It shows how much the value of water really needs to be looked at.

Mr STUBBS: We saw some pretty non-strategic thinking when the water buyback first started. There was no strategic plan as to how these entitlements were going to be purchased. They often talk about the Swiss cheese effect. In my view, one of the silly ones was down at Mildura in some of those high-density horticultural areas where they simply were encouraged to sell out 15, 20 hectares, and 10 to 20 hectares were not allowed to ever go to putting back in new irrigation. They just became dust bowls. They really became parcels of land that nothing could be done with. We do not want to see those sorts of things repeated.

CHAIR: Given your comments about the Murray-Darling Basin proposals, what are your views on the management of Lake Alexandrina?

Mr HOGAN: To be honest, as the second driest continent in the world I do not think we can afford the luxury of continuing to evaporate that sort of water. It would be lovely if we could, but water is a limiting resource, as we all know. Food requires huge amounts of it, so into the future that luxury will not be available.

CHAIR: Particularly if they are taking 3,200 gigalitres out of the system in the rest of the basin and approximately half that amount is being evaporated each year out of Lake Alexandrina alone.

Mr HOGAN: That is right.

Mr STUBBS: It takes a lot of water to get down into Lake Alexandrina, only to see it evaporate. We have been disappointed that some key issues about the lower lakes and the barrages or whatever are not being looked at more closely because, again, it is not part of the big picture.

The Hon. Dr PETER PHELPS: I return to the idea that generating additional water resources into the southern basin must be found to ensure the long-term future of the region. What are those innovative solutions? Is not the real problem that water is being taken out for environmental purposes? Do you not need to find more water to come into your region to accommodate at least a proportion of the amount that is being taken out for environmental purposes? It is a man-made problem, not a nature-made problem, is it not?

Mr STUBBS: True.

Mr HOGAN: What has crossed my mind is that had the $13.1 billion or whatever it was been put into water storages just for the environment, one wonders whether we could have got over this issue a little easier. However, it was not meant to be.

Mr STUBBS: Originally there was $5.8 billion for infrastructure upgrade. We have seen some delays and not a lot of that money has been spent, but there have been some projects on farm and off farm. One thing I often wonder about is how much of that low-hanging fruit is already got, and how much capacity is there to really get a whole lot more savings out of that infrastructure money.

Mr HOGAN: We need to reaffirm that statement. As an irrigator I have been making these changes for at least 25 to 30 years. The industry does use that term "low hanging fruit" but I can tell you that many years ago with the onset of the drought, if we had not made those changes and efficiencies, I would not be here talking to you. We would be gone, financially. Getting that extra water is going to take a serious amount of money.

The Hon. Dr PETER PHELPS: I take it from your submissions today and from your written submission that you are less than happy with certain environmental groups and their proposals. What has been your practical experience rather than generalised concern? Have there been any practical matters you can raise with us today or examples where environmental groups have been less than appropriate?

Mr HOGAN: Trying to answer it is not easy. The environmental group and the Murray-Darling Basin Plan—I think Mike Taylor was correct—is structured in such a way that it deals 95 per cent for the environment. Unfortunately, it has not considered the other picture. It has just been singularly focused. One of the problems you have when you live, breathe and work in our environment along the river in irrigated agriculture is that others do not see what is really happening. It seems to me that the plans have this philosophy of more water for the environment is better, but nobody is measuring it. We still do not have an environmental plan for this massive amount of money that is being spent and will be spent. It is still not there. People who live on the river are asking why do they want more water. The original plan was over bank events to water environmental sites. With regulated rivers and dams, people have settled on that country. People in the Tumut Valley know that they can work that country year in and year out and not face a flood in spring. I know the river channel is a problem, but if you take that away, the third-party impacts are just going to be horrendous. One of the things that States have to watch with the Commonwealth is that if those third-party impacts become a reality some time down the track, the States have to make sure we are not picking up the tab for that.

The Hon. Dr PETER PHELPS: Is it fair to say that your view is that regulated rivers should be looked on more as agricultural channels first and natural rivers second?

Mr HOGAN: I think we can marry the two with engineering works. The channel in the Murray is enormous and to try to push enough water down the middle of that channel system to have an over bank event, you will have that much run out the other end Adelaide will disappear—a slight exaggeration. And for what at the end of the day? There has to be a balance. I am sure there are engineering works where we can put in pumps and systems, get water into our iconic sites and do all that and at the same time it is a trade-off. I keep harping back that without water we do not have food. There is a balance and it is not going to be easy to obtain that balance, but we have to have it.

Mr STUBBS: It is worthwhile reflecting that little bit of history. Perhaps we are cynical about the environmental quantities involved. In 2003 when Richard Ball was chairman of Water for Rivers I was living on the coast and we had come back to Albury-Wodonga. He got me to set up the office for Water for Rivers and get Neville into the position. That tri-government agreement—Commonwealth, Victoria and New South Wales—was to convert some 280-odd gigalitres into environmental flows: 212 for the Snowy and 70 for the Murray. We had the Living Murray come along and talk about the importance of our key environmental assets, the icon sites, 500 gigalitres. About that time the word getting round was, "Really, we need about 1,500 gigalitres to fix up the Murray system". We then had the Red Gum national parks debate and Dr John Williams came along. Part of that was, "No, we really need 2,500 gigalitres." Then it suddenly became 4,000 gigalitres, and then you may or may not have seen some of the demands have even talked has high as 7,600 kilolitres. Even with the Prime Minister announcing last week the extra 450 on top of the 2,750, a lot of the media our way coming from those groups was to the tune of, "Well, that's a start". As Terry said, with no real environmental plan as to how effectively this can be done, you do become worried and cynical about the future.

Hon. STEVE WHAN: Does that not make it more important to lock in a figure fairly soon so that there is some predictability for the communities on the way?

The Hon. Dr PETER PHELPS: Except that it is a one-way ratchet with The Greens, you know that. They take their 2,700 and then in five years time they will say it has to be 3,000.

The Hon. STEVE WHAN: The only way is to look at it in long-term legislation.

Mr STUBBS: Absolutely.

The Hon. STEVE WHAN: Otherwise if you do not lock it down you will see that happen.

The Hon. Dr PETER PHELPS: Let us look at what The Greens said about forests in Tasmania 25 years ago and find out what they are saying today, and that is that it is a one-way ratchet.

CHAIR: Gentlemen, we are out of time. Thank you, Councillor Hogan and Mr Stubbs, for coming before the Committee today and for your submission. You have given us some good food for thought. If there are any further issues the secretariat would like to clarify with you, they will contact you. If you would return that information to us within 21 days, we would appreciate it. Thank you for coming along.

Mr STUBBS: Certainly.

Mr HOGAN: Thank you, Mr Chairman and Committee members. We wish you well in your endeavours.

(The witnesses withdrew)

(The Committee adjourned at 12.56 p.m.)