REPORT ON PROCEEDINGS BEFORE

PORTFOLIO COMMITTEE NO. 7 - PLANNING AND ENVIRONMENT

INQUIRY INTO THE RATIONALE FOR, AND IMPACTS OF, NEW DAMS AND OTHER WATER INFRASTRUCTURE IN NSW

CORRECTED

At Jubilee Room, Parliament House, Sydney, on Friday 27 November 2020

The Committee met at 9:20.

PRESENT

Ms Cate Faehrmann (Chair)

The Hon. Mark Buttigieg
The Hon. Catherine Cusack
The Hon. Ben Franklin
The Hon. Shayne Mallard
The Hon. Mark Pearson (Deputy Chair)
The Hon. Penny Sharpe

CORRECTED

The CHAIR: Welcome to the third of five hearings of the Portfolio Committee No. 7 inquiry into the rationale for, and impacts of, new dams and other water infrastructure in New South Wales. Before I commence, I would like to acknowledge the Gadigal people, who are the traditional custodians of this land. I would also like to pay respect to the Elders of the Eora nation, past, present and emerging, and extend that respect to other First Nations peoples present. Today we will hear from an environmental and river expert, followed by the joint organisations of councils in the relevant regions. We will also hear from the peak irrigation body and other conservation groups. Before we commence I would like to make some brief comments about the procedures for today's hearing. Today's hearing is being broadcast live via the Parliament's website. A transcript of today's hearing will be placed on the Committee's website when it becomes available.

Parliament House is now open to the public. All visitors, including witnesses, are reminded that they must have their temperature checked and register their attendance in the building via the Service NSW app. All witnesses have a right to procedural fairness according to the procedural fairness resolution adopted by the House in 2018. I remind everyone here today that Committee hearings are not intended to provide a forum for people to make adverse reflections about others under the protection of parliamentary privilege. I therefore request that witnesses focus on the issues raised by the inquiry terms of reference and avoid naming individuals unnecessarily. There may be some questions that a witness could only answer if they had more time or with certain documents to hand. In these circumstances, witnesses are advised that they can take a question on notice and provide an answer within 21 days. I now welcome our first witness, Professor Richard Kingsford.

RICHARD KINGSFORD, Professor of Environmental Science and Director of Centre for Ecosystem Science, School of Biological, Earth and Environmental Sciences, University of New South Wales, affirmed and examined

The CHAIR: Thank you very much, Professor Kingsford. Would you like to start by making a short opening statement?

Professor KINGSFORD: I would like to thank the Committee for inviting me. My background is as a river research scientist. I worked for the New South Wales Government for 18 years and I have been at the University of New South Wales working as a researcher since then. I have worked for nearly 40 years on the rivers of the Murray-Darling Basin and elsewhere. In particular I have worked on the Darling, Menindee Lakes, Macquarie River, the Lachlan, Border Rivers and Namoi systems. I do surveys regularly over these systems every year. In fact, we surveyed all of them this year in October and November. I have mapped all the wetlands across the Murray-Darling Basin. My research is on waterbirds, invertebrates, frogs, woodland birds, vegetation, turtles and platypus. I advise various State Governments and have done on various Committees over the last 20 or 30 years. Thank you.

The CHAIR: Thank you, Professor. I will kick off with some questions to begin with, and then we have crossbench questions, Government questions and Opposition questions. I noticed that last week there was research that was released in relation to the platypus. Would you care to briefly explain to the Committee what that research is about and what the potential impacts of dams are, or these new dams could be, on the platypus in New South Wales?

Professor KINGSFORD: Thank you, Chair. That research was research from our group. I was involved in that with two colleagues. We have done what is called a risk assessment of the platypus, trying to find all information on its distribution and abundance across Australia. As a result of that research, we have put in a nomination to the Environment Protection and Biodiversity Conservation [EPBC] Act to be assessed as vulnerable across its distribution. We have also done that to the Threatened Species Scientific Committee in New South Wales. The problem with the platypus is that it is affected by a whole range of different threats. In relation to your question, our research is showing that large dams can fragment populations; so, they are not able to move up and down river systems past some of the large dams.

We have also worked quite a bit on the River Murray downstream of Dartmouth Dam. One of the major changes that has occurred there is that the delivery flows down to Hume Dam from Dartmouth are at a poor season and they are very cold. That is making the invertebrates and that environment very poor, so the platypus are not doing well there. We have also looked at the impacts of pollution in rivers for platypus. There is clearing of riparian areas. More recently we have been looking at the effects of fire on some platypus. So, there is a range of major issues for platypus on river systems.

The CHAIR: Thank you. Thanks very much for the submission you made to the inquiry. In your submission you stress what occurred before the passing of, or the establishment of, the Commonwealth Water Act 2007 and the circumstances that were taking place in terms of our rivers and the condition of our rivers before then. Would you care to explain a little bit about the history of why that Water Act came into force?

Professor KINGSFORD: Yes. So, people will remember that we had the millennium drought from 2002 to 2009. There is some argument about some of the actual dates, but that obviously focused Australians on some real concerns about the management of the Murray-Darling Basin and prompted the Government at the time, under John Howard, to essentially take over some of the oversight of the Murray-Darling Basin rivers. Previously before that they were run by the Murray-Darling Basin commission under each of the States and it was primarily a consensus approach. If a particular State did not want something to happen then they could stonewall it. The Federal oversight was to try and remove some of that blockage, if you like, and look to try and get a more sustainable outcome for the Murray-Darling Basin rivers.

The Murray-Darling Basin rivers are primarily in a degraded state as a result of the building of large dams and over-allocation of water in those dams for irrigation. So, the Water Act was part of the legislative framework. It was also subsequently, in a policy and management sense—the Basin Plan was its implementation tool, if you like. Part of that was to try and restore some of the healthy condition to the rivers by buying back water from willing irrigators, which occurred quite a lot across the basin. More recently the Australian Government has put a stop to that, so there are efficiency programs to try and deliver 2,750 gigalitres of water. The scientific evidence was that if you really wanted to be sure of delivering full ecological health, you needed probably 7,000 gigalitres. So, the consensus is that 2,750 gigalitres is not sufficient, particularly for the flood plains and the health of the Murray-Darling Basin rivers.

The CHAIR: Thank you. That was very useful. Thanks for being patient with our audio, as well, as we are trying to get that right. You also state in your submission that these dams and the water they will capture will be inconsistent with the Water Act 2007 and the Murray-Darling Basin Plan. Again, could you expand on that further for the Committee?

Professor KINGSFORD: One of the main objectives of the Water Act was to try and achieve sustainability in our river systems. We have abundant scientific evidence that what is causing a lot of that unsustainable degradation is that the water we are capturing in our large dams is water that flushes out those rivers, flushes salt from those rivers, and delivers nutrients and water to downstream ecosystems. So, one of the relatively poor understandings about rivers is that they require large flood plains, which is where native fish breed and where invertebrates are. Some of the most important traditional owner and cultural heritage sites are on these areas.

From our history, we are aware of the Nile Delta. We have lots of those sorts of deltas on our river systems. What we do when we put large dams in is capture that water that would go out onto those areas. And so, in large parts of the Murray-Darling we are seeing this long-term decline and death of forests of river red gum, black box and coolabah because those floods have essentially been taken out of the system. In terms of the inconsistency the issue really is: How do we restore the health of the rivers of the Murray Darling Basin, which is what the Australian public wanted? Essentially by building large dams we are actually going against that sort of major imperative for rivers. I think there is an understanding that there needs to be some balance, and that was what the basin plan was trying to strike.

The Hon. MARK PEARSON: I just need a bit of clarification. The argument is being put to us that once the dam fills then there will be flow from that. Can you explain the difference of what is necessary for the health of the rivers, and therefore all of the animals and other things that rely on it, if there is a constant flow from the dam as opposed to flooding? We need to understand and argue one way or the other.

Professor KINGSFORD: I understand that. If we take Wyangala, for example, and the doubling of the size of Wyangala, the important thing is that would essentially take out the large floods and allow that storage of water over a number of years to deliver the 21 gigalitres estimated to be delivered. The issue is: Where does that water go? That water stays in that river but essentially would not go much further than probably the Jemalong irrigation area, so the damage done to the river system is primarily downstream of that. Yes, that water will still flow down the river, but it flows only to a point where it is taken out; downstream of that is where you see the real impact. The major wetlands like the Booligal system, the Cumbung system and even Lake Cowal and the Lachlan swamps will be the major places of damage in terms of what happens.

The other thing to say about this is that our rivers have always naturally been boom and bust systems, so our plants and animals are used to that. When we put a large dam in, we regulate that, so we essentially are able to control the flows. What has happened in a lot of our rivers is that we do provide more low flows, which are important in terms of delivering that water for irrigation, towns and stock and domestic, but it also means that we are providing better habitats for things like carp and gambusia. They love living in constant water and when the rivers do dry up, the native fish species are much better at being able to deal with that sort of natural system and carp and gambusia really benefit from the constant flows in the rivers. There are a number of different issues to do with the effects of dams on ecosystems.

The CHAIR: You recently contributed to an article on the debit and credit model for dams, published in September in the Journal of Hydrology. I think the management of the Gwydir versus the Macquarie and Lachlan is particularly interesting for this inquiry. Could you explain that concept?

Professor KINGSFORD: Certainly. I think the difficult thing in terms of understanding water management in New South Wales is obviously we have a Water Act, we also have an agency that manages that water and we have the Murray-Darling Basin Plan—those are all things that are consistent across the State. But what we did was say, "That might be the policy and legislative architecture, but what really happens in terms of turning the taps on and off?" The critical thing is that we identified that there are different ways that WaterNSW manages its rivers.

In the Gwydir, for example, we called it a debit model in the sense that at Copeton Dam the managers would wait until they had enough water in Copeton Dam to decide how to allocate that water. But in the Macquarie and also the Lachlan there is what is called a "credit model", which essentially means that the water managers look at the period of inflows and then take a much riskier approach to allocating water. So, they say, for example, "We would expect, on the balance of probabilities, between July and December that we would get this much water looking at the last 100 years of record, and therefore we are going to start allocating that water even though we do not have it in the dam." The issue might seem fine but as soon as you move into a dry period and add the effects of climate change, you are actually pushing these systems much harder than they would have been—you are taking a risky approach. What we find is that the Macquarie dried up because essentially too much water was

given out, there was not enough security for towns and the mine, and so they actually had to turn off the river to essentially provide essential supplies.

If they had taken a debit model—a less risky approach—or in fact looked at predictions of climate change and said, "We expect this river to be drying up in the future", then there would have probably been more water. There is actually a much better argument than the argument that we need to drought proof or increase water security by building dams, and we need to manage our rivers much better so that we have a enough water in the dams for essential supply. Most of the water in those dams is for irrigation; it is not for critical human needs. It is only about 2 per cent of that water and we have the capability to hold onto that water for a long time over large drought periods to be able to carry that through.

The CHAIR: What would have been the difference if the Macquarie and Lachlan valleys operated with a debit system in the preceding years? What would that have meant for irrigators? Is the difference that they would have had access to so much water in the previous years that they would not have had access to?

Professor KINGSFORD: In practice, it would have meant that they probably would have got less water because you would have held some water back to ensure that you are able to carry that river over into the very dry periods. If you had a wet period, they would have got the same. It is an issue really about managing for climate change and I notice that the New South Wales Government has just done a whole lot of new modelling to say all of these rivers are going to get much drier—I think that was reported in *The Australian* two days ago. That is a big issue because a lot of the modelling that has been done for the rivers has been using the historical record, so it has been saying, "What have we had in the past?"

It is not clear to me—even in the delivery of the 21 gigalitres of water that Wyangala is supposed to deliver—whether in fact they used all of the past flow record or if they were predicting into the future. The dividend for the 650 gigalitres increase might not be 21 gigalitres if, as the New South Wales Government is saying, we are going to have a much drier future and I think the numbers are up to 20 per cent drier. In fact, when CSIRO did its 2008 modelling, it estimated that there was 8 per cent less rainfall in the 1997 to 2006 period and 24 per cent less run-off in the Lachlan for those recent years. It is quite different if you then do your modelling for 100 years, which is what the integrated quantity-quality model uses in terms of the water agency. You actually are underestimating and overestimating the yield that you get and underestimating impacts.

The CHAIR: Would you like to talk about the impact of the Gin Gin Weir on the Macquarie Marshes?

Professor KINGSFORD: Yes. I have been researching the Macquarie Marshes for nearly 20 or 30 years. We have shown major impacts in the scientific literature; the marshes are at least 50 per cent smaller than they used to be. There has been a decline in the breeding of water birds and there has been a decline in the overland flooding for graziers —most of the Macquarie Marshes is owned by graziers, so there is an impact on them as well. The impact has been so much that the Federal Government has admitted to the international community that there is a change in ecological character—in other words it is degrading. There is nothing in our recent research that tells us that we have really arrested that.

The problem with the Macquarie re-regulating weir is that it is capable of capturing water and storing water that comes in from the Talbragar and the Little Bell and the Bell, which are downstream of Burrendong, and therefore is able to, as it says, re-regulate. It holds that storage and is able to then potentially divert to improve general water security, which is one of its purposes. A lot of that water is really important in terms of the fish breeding, the invertebrates and all of the things that make the river healthy because it is not cold from the bottom of Burrendong Dam, it is coming through natural processes and the nutrients are still there. We know that these weirs also capture sediment and nutrients as well as being barriers for things likes fish species. There is certainly no environmental benefit of building that weir and there is a lot of risk in terms of downstream impacts, not just to the environment—the river—but also to the rural communities downstream.

The Hon. BEN FRANKLIN: Thank you so much for being here, Professor Kingsford. Do you accept that Australia, and I guess New South Wales more specifically, have some of the most stringent environmental protections of anywhere in the world?

Professor KINGSFORD: More broadly or in terms of rivers?

The Hon. BEN FRANKLIN: Both.

Professor KINGSFORD: We have pretty good environmental regulations. I think there is certainly room for improvement. I think we have some real issues around land clearing. I think we have some real issues about the way we manage our river systems, but I think there are some real positives as well.

The Hon. BEN FRANKLIN: Do you accept that Wyangala Dam, which you talked of before, would still be required to go through the usual vigorous environmental approvals, including biodiversity offsets, like any other project?

Professor KINGSFORD: Yes. I do understand that and I also understand that under the bilateral agreement, the sign off will have to be done by the Federal environment Minister as well as the State planning Minister. We obviously need to see the environmental impact statement [EIS] and there is a process to go through. It will be very important to ensure that the environmental assessment process adequately measures the impacts, the costs and the benefits of the dam for downstream communities, including rural communities and traditional owners, and the environment. There are a whole lot of ecosystem services that are generally not picked up very well.

For example, I am very familiar with the Lachlan; it is one of the most important waterbird breeding sites. In 2016 there were 100,000 breeding pairs of straw-necked ibis; straw-necked ibis eat locusts and they are so fundamentally important. What happens in the Lachlan is really important for rural Australia because these birds move right across the continent, so will happen if we lose those breeding events, not just in terms of environment but also economics and in terms of the rural communities, is also important to pickup in the EIS.

The Hon. BEN FRANKLIN: You raised the issue of weirs in one of your answers to the Chair. We heard from witnesses at one of our last hearings that one of the main concerns with the Western Weirs is the potential to damage fish breeding habitat by interrupting normal water flows. Do you agree with that contention? Do you have any ideas on how we could design the system to avoid that occurring?

Professor KINGSFORD: Yes. Definitely, the science tells us that when we build these barriers, we change the flows and those triggers for breeding are affected. I read the transcript from the fish researchers in relation to that. I think, obviously we have got to try and get water security for places like Wilcannia, but I think there are other mechanisms. In particular, people talk about off-river storages as being one way of potentially capturing that water without building a weir. I think there are obviously ways of having fishways so that you can put weirs on, but they are not generally as good as having nothing because obviously the fish have to work their way around some of these things. It really depends on the size of the weir and the impact it has on that flow and flooding regime in the system as to how much of an impact you are going to have.

The Hon. BEN FRANKLIN: You also mentioned in one of your answers the issue of critical needs. Obviously, both the Commonwealth and New South Wales Water Act prioritise water for critical needs. What is your definition or understanding of critical human needs?

Professor KINGSFORD: I think my understanding of critical human needs includes obviously drinking water to ensure that communities have enough of that. I think there are critical human needs around economies.

The Hon. BEN FRANKLIN: Would it include, for example, water for employment and jobs and those sorts of things?

Professor KINGSFORD: Yes. I think definitely. I think all of those sorts of things are important. I think it is also important to work out what the jobs that we want now and in the future are. For example, some of the major economic decisions that are being made around water—the basin plan has cost us more than $13 billion and that is what the taxpayer has had to pay after as a result of the damage. The question I have is: If we were able to think 30 years ago or 50 years ago, would we have made those decisions about what was the best economic infrastructure to establish in these places that was more long-term and sustainable and would not cost taxpayers? I think defining exactly what critical human needs are is very complex but very important.

When I think of critical human needs I also worry about some of the traditional owner communities that are being seriously affected by the drying up of the Darling River and some of that is obviously to do with the drought, but we also know that it is to do with the way that we have been managing those rivers—there has not been water coming down the systems.

The Hon. BEN FRANKLIN: You talked about what we might have done differently 30 or 50 years ago knowing what we know now. I will frame that slightly differently. We have heard evidence about some regional centres and cities having significant population growth targets—I think Tamworth is looking to be at 100,000 by 2040. Do you think those sorts of targets are realistic? Do you have any comments on whether communities like Tamworth would then have enough water to meet those targets?

Professor KINGSFORD: I am not a demographer, but certainly I think we are going to see some major changes and some of those are probably COVID-related as people get out of big cities and want to get into these places, and I think that is a good thing. Obviously, water is a very big issue in terms of making sure there is enough for growth, but I do think it is very important to realise that water for urban supply is a very small amount

compared to how much water we are taking out of rivers. In relation to Tamworth, I am not sure exactly how much it is, but it is probably not more than 10 per cent. As I have mentioned before, I think we can get a lot smarter about the way we manage our rivers and also town water supplies so that we can actually take in that growth. If we had more water in Lake Keepit and Split Rock Dam then it would be possible to grow some of those urban centres, but it would come at a cost for the irrigation industry. Those are some of the very difficult decisions that I think need to be made.

The Hon. BEN FRANKLIN: Do you think environmental water managers are managing both held and planned environment well? Do you have any comments on the job that they are doing to manage environmental water during droughts?

Professor KINGSFORD: I think they are doing a very good job generally. They are constrained in how good a job they can do and those constraints are: How much can they use that water and where? There are issues, as you would be aware, in terms of flooding private land—what is called constraints. Water managers are trying to get some of that water out of the main channel of the river onto the flood plains, as I mentioned before, which is a very important aspect of it. I think there are some real challenges in terms of measuring what is happening, understanding that trajectories have changed, seeing how good a job we are doing in different places with how much water, and what opportunities there might be to manage it differently.

In relation to drought, the difficult thing of being a water manager, as opposed to say a farm manager where you are managing one particular species like cotton or rice, is having to manage thousands of species and our knowledge base is very poor on those. We have been very poor about investing in understanding how these organisms react, and so it is really rudimentary currently. They are trying to do the best job but there is a very poor information base and I do not think there is enough monitoring going on or modelling to say if we could do it in different ways that might be better.

The Hon. CATHERINE CUSACK: How are the governance arrangements for science and scientific study operating and how could we improve them?

Professor KINGSFORD: That is a difficult question because science comes in all forms. I think in terms of the science of rivers there are a few breadcrumbs, if you like. We do not invest that much compared to how much water we are actually using. Most recently, the Murray-Darling Basin Authority put out a tender for $20 million to be spent on research and rivers. When we think of how big the job is and how much water we are managing, it is not very much. I do not think we are monitoring enough of each of the river systems where we have got environmental water. I think the New South Wales Government in terms of science is probably one of the best State governments in terms of investing in knowledge that guides policy, and I see that improving all the time.

I think where we need to get better—and it is coming—is to be more transparent with the way we collect data and put it out there. For example, we need to be able to say where the water is going. There is a very difficult area around flood plain harvesting and it is causing a lot of heartache in different places because we do not know how much of the water in a river that gets over the banks is being legally taken or is being diverted in different ways or is going onto the flood plain or is environmental water. We need to understand what that equation is. There are other issues in New South Wales in relation to things like land clearing where we need to provide that transparent scientific data that then allows an open public debate. Obviously as a scientist, I think it is fundamentally important for us to have the data for decision-makers to then make the decisions about what to do with that scientific information.

The Hon. CATHERINE CUSACK: In your submission you mentioned that there are other options for water security that you do not feel have been adequately investigated. I wonder what those options are.

Professor KINGSFORD: I think the Government has got some really good options in some of its regional strategies. There are things like off-river storages, and in other parts of Australia, particularly Western Australia, they use underground storages in terms of aquifers for holding water. Obviously one of the things we are not very good at in many places in Australia is that when we think about water we go, "Supply option: we have got to find more water." You do not create more water—you cannot make it rain more—so you are essentially taking water from somebody else. But we can put a lot more effort and energy into the demand part of the equation—in other words, making more efficient use of water.

For example, in the Lachlan there is a great opportunity for a win-win where we have got essentially a very inefficient irrigation system that has not been a beneficiary of the Federal Government's efficiency program. In fact, some of that water that the Federal Government could invest would increase the potential irrigation output and free up some of that water that could actually be used for town water supply. When we think about some of

the arguments about droughtproofing and water security, they are already there in what we have got if we got a lot more imaginative and did not just go for the old supply option of: Where can we build another dam?

The Hon. CATHERINE CUSACK: Can you elaborate on flood plains and groundwater and the consideration that the water system is a much bigger system than what you see in a river?

Professor KINGSFORD: The Lachlan, which I have been talking about a bit, has got 470,000 hectares of wetland that we mapped using satellite imagery. Many of those areas are flood plains; there is this massive sheet of water. In 2016 it was an amazing place, and even this year there is quite a bit of water; it is only a small flood, not big enough to trigger the bird breeding. Those flood plains are really where you get the resources that will carry that river over for the next five to 10 years. You get this big boom in the native fish breeding out on those flood plains, and waterbirds, and a whole range of different organisms, and the trees obviously start growing. That keeps things going as that river shrinks back during a dry period. They are fundamentally important for the long-term future of our rivers.

In terms of their interaction with groundwater, some of these aquifers are very close to the surface—that groundwater system may as well be a surface water system. The problem we have got is we have very poor understanding of the connectivity of those systems. We do not really know how much water there is and the connections of that groundwater to different systems. It is a very difficult area to be working in because of the way water moves underground. The sustainability of groundwater systems is also a huge issue, not only in the Murray-Darling but around the world.

The Hon. CATHERINE CUSACK: Is it part of the Great Artesian Basin system?

Professor KINGSFORD: The Great Artesian Basin system is that massive underground area in Central Australia, but it goes up into the Great Diving Range. It takes water from the Great Dividing Range and northern Australia, but it is very deep and it is very old water. Obviously a lot of rural Australia takes water from there for livestock dams and so on. As well as that, there are lots of other shallow water aquifers on each of the river systems, so that water is moving not only down our rivers but also going from our rivers into aquifers all over the place. Trying to identify how much water is in those aquifers and making sure we are not mining some of those is another huge water issue which we are not dealing with very well.

The Hon. PENNY SHARPE: On page 7 of your submission you talk about the National Water Initiative, which is an agreement that all governments have signed up to for full cost recovery on this type of infrastructure. We have had evidence from government agencies and others, and I would argue that they have been a little opaque around who is ultimately going to pay for this infrastructure. What is your understanding of how the National Water Initiative and its pricing operates? In normal circumstances what would you expect from the dam projects in terms of who is going to pay and who is going to decide?

Professor KINGSFORD: I think it is a difficult grey area if you look at the way people are interpreting it. My interpretation of the National Water Initiative was that all new infrastructure should be on a user-pays basis. There should be a very good look at what the public benefit is versus the private benefit—to be sure about how much that private benefit not only has to front up for the capital cost but also the long-term maintenance cost. The issues around some of this current proposed infrastructure are very important and very serious. Even with the current estimates of Wyangala, that might be $30,000 per megalitre if you take the current 21 gigalitres. A recent article in *The Guardian* stated that it could even be up to $1.5 billion, which sort of doubles that amount.

I guess my big concern would be: Who is actually going to be paying for that and who are the beneficiaries? Let's be quite clear about what the private and public benefit of that is, and also the public cost. As I have articulated, there are significant public costs and they do not go away; they will be there forever and you will not be able to turn the clock back. I think we need to get more transparent about what the real cost of it is.

The Hon. MARK BUTTIGIEG: Does that mean that under the current configuration of how the National Water Initiative is administered there is no proportionality between private and public use in terms of user-pays?

Professor KINGSFORD: I do not think I can really answer that question. I am only looking at what the National Water Initiative says, and it is not clear to me how much subsidy—if you like—government gives to these and how much prerogative a particular government at the time would have to give that, or, in fact—as in some of this infrastructure—how much of that is coming from taxpayers' money at the Federal level as opposed to the State level. There are presumably mechanisms within the Independent Pricing and Regulatory Tribunal [IPART] to look at pricing for water and it has been quite strong in terms of trying to get back at least the maintenance cost. Generally, for current infrastructure, IPART thinks of capital costs for the dams that are already there as sunk, but for new dams you would think that cost should be clearly apportioned to the beneficiaries of that water.

The Hon. MARK BUTTIGIEG: It sounds like it is not clear.

Professor KINGSFORD: No, it is not clear to me.

The Hon. PENNY SHARPE: I have visited some of the flood plain graziers on the Macquarie Marshes and across the State; the impact on them is significant. Has any work been done to try and measure the impact on the flood plain graziers across the State as a result of changes over time?

Professor KINGSFORD: That is a very good question. I have been working with the rural community quite a bit, and in fact when we mapped all of the wetland systems—i.e. the flood plains across the Murray-Darling Basin—I think about 85 per cent of them were privately owned. They are areas that people have actually often bought specifically because they flooded. We know that graziers get a more productive capacity in terms of livestock from those flooded areas because all of that grass is growing and it then gets taken up. They have been really affected; some of them talk about losing up to 50 per cent of their income. To me, the real opportunity is to understand what the real costs are not just for the environment or the river or Indigenous groups but we need to think about what the real costs to the rural community are as well. And then, what are the restoration costs going to be for these river systems? We have got some idea about that already from the basin plan, and it is not cheap.

The Hon. PENNY SHARPE: No, it is not. We have got all of these Ramsar-listed sites that are very environmentally important and biodiverse, but a lot of them are on private land. Are we at risk of losing Ramsar listing for some of our sites if some of this goes ahead?

Professor KINGSFORD: We can think about the current Ramsar sites, like the Macquarie Marshes, the Gwydir systems and Narran Lakes—all of those are in trouble.

The Hon. PENNY SHARPE: You said previously that the Macquarie Marshes has shrunk by 50 per cent. What is the trigger for losing that international Ramsar listing and is that a realistic prospect?

Professor KINGSFORD: Like a lot of environmental policy and legislation, it is pretty weak. There is no threshold that says you are going to lose it; it is actually up to the country to do that. There is a so-called shame file, which is called the Montreux Record; some things get listed there. Countries do not like doing that very much and there is fairly poor long-term assessment of those areas. In terms of your question around other systems, not everywhere is a Ramsar site—

The Hon. PENNY SHARPE: No, that is right, but they have significant swamps.

Professor KINGSFORD: That is right. Lots of areas could and should be Ramsar sites. The Lachlan has the Cumbung, Lake Cowal, the Booligal system, and Murrumbidgee has Lowbidgee. All of those should be Ramsar sites; they are certainly within Australia's most important wetland areas.

The Hon. PENNY SHARPE: And they meet all of the criteria for Ramsar.

Professor KINGSFORD: They meet all of the criteria. It is sort of a lack of political will to actually make them Ramsar sites, and that also needs to have—for quite obvious reasons—the support of the owners, and often they are privately owned. We do have a few privately owned Ramsar sites, but generally people have been a bit loathe to go down that path. By holding back some of this water, we are in danger of affecting and degrading these sites.

The Hon. PENNY SHARPE: On page 9 of your submission you talk about how some downstream towns actually have their water security reduced rather than improved by the new projects. Can you expand on that?

Professor KINGSFORD: One of the things we have realised is that when we build dams, we think we are securing water—and as I have mentioned with the debit-credit model, if we managed our dams a bit better and less riskier in terms of giving away water, I think that is possible—but the problem is that if you are storing water, as you get further and further down the system, you get less water down the bottom in drought times. For example, when the Macquarie got turned off, it essentially meant there was no water going down to communities in the Macquarie Marshes or out near Carinda and think about the disaster on the Darling River, where Bourke had a bit of water but Wilcannia ran out of it. They are things that could have been avoided but happened because we took too much water out of that river as a result of building structures that hold water and allow us to allocate too much water.

The Hon. PENNY SHARPE: On the credit-debit management, who decides what model is going to be used? Is that a decision for WaterNSW? I know it is very complicated. Why would one be a credit model versus one as a debit? Is it historical?

Professor KINGSFORD: We know that water management is very complex; it is even more complex at the local level. Dam operators are making these decisions. They are already under a policy and legal framework that should be consistent across the State, but they are not operating that way. They are essentially going off a history and what their particular interpretation of running a river is. Some dam operators think that the most effective way to run a river is to get as much water out of it as possible, and therefore they will adopt a credit model. They will say, "The best way of getting the most water out of this is to start to predict how much water we are going to get into this river system and give that away as soon as we possibly can."

What it pushes the rivers towards is having no buffer. After the big 2016 floods and most of the dams filled, we would have had enough water in the Murray-Darling to hold that water for all of the towns through the 2018 and 2019 droughts. We would have had enough water to keep going down the Darling and avoid the fish kills; we did not. We did not because we had given that water away as allocations. Obviously that came with significant agricultural productivity in those areas, but it does cause a major block in terms of what happens to these river systems in the dry times. The jump to say that you need to build more dams to get more water is not going to deal with that problem; it is probably just going to exacerbate that problem.

The Hon. PENNY SHARPE: Those are such divergent models being used dam by dam. I assume that the arguments around that are that people understand their local area and look at the history of what it has done. The water managers are trying to do the right thing. I am interested in how there can be such divergent models within the same policy and legal framework.

Professor KINGSFORD: I think a lot of it is legacy. I think a lot of it is: How was this dam managed in the past? Particular water managers would be a little bit more conservative and there is wiggle room within the legislation and policy framework that maybe allows them to do that.

The Hon. PENNY SHARPE: I might ask Councillor Bill West this question when he comes on next. Do the water managers have some consultation locally with irrigators and councils? I know they are not just making decisions in a vacuum. Is that how it operates?

Professor KINGSFORD: They have different stakeholder committees. They have a customer service committee, usually, made up of water users. They will also have an environmental flows reference group. All of those people are involved in the decision-making, but a lot of the big decisions about how you operate a particular river are hardwired and some of those decisions have just been made over time and everybody is used to them, so it is very difficult—

The Hon. PENNY SHARPE: To change it.

Professor KINGSFORD: Someone described it to me as being like a spider's web; if you pull on one little bit, you are going to change the whole thing. That is a fundamental challenge. As soon as you start changing one of these levers, it has implications for not just how much water you have got now but how much water you will have tomorrow and in three weeks time.

The Hon. PENNY SHARPE: You touched on the Booligal system and the issue with the breeding grounds of the ibis and their impact around pest management across New South Wales. Given the numbers—200,000 birds—I assume they eat a lot of locusts.

Professor KINGSFORD: They do.

The Hon. PENNY SHARPE: There is a real cost to the entire farming community if they are to be lost because how else are you going to deal with the locusts?

Professor KINGSFORD: When I was in the Macquarie Marshes, I remember seeing this wave of locusts, but right at the front was a whole flock of ibis and they were just mowing them down. You have got this pest mitigation going on that no-one is measuring, which is great for the environment and farmers, but it is not counted on any balance sheets.

The Hon. PENNY SHARPE: No, it does not get counted anywhere.

Professor KINGSFORD: Most importantly, those ibis that are in the Booligal system or the Macquarie Marshes are actually then spreading out right across Australia and doing that job for nothing everywhere. That is, again, one of those areas that we know nothing about but that is really important, and the sort of decisions we make on that will have huge implications forever.

The Hon. PENNY SHARPE: The point being that they are just not included in the equation.

Professor KINGSFORD: No.

The Hon. MARK BUTTIGIEG: Earlier you gave a figure of 2 per cent of water supply in order to meet water needs for towns. Essentially what you are saying is that there is enough water to meet those essential requirements, it is just that if there is a drop in the amount of water falling from the sky over time and the agricultural sector is growing, the need for that water is growing and ultimately it is the towns that are getting sacrificed for irrigation because the allocation is not proportional. Is that pretty much it?

Professor KINGSFORD: I think it is a little bit of that. The other part of it is that you could keep a buffer for town water supply to get you through the dry times. Also—and I am thinking about the Lachlan—a lot of those towns are on groundwater, so they have already got secure water supplies. They do not need additional large storage at the top in terms of river water.

The Hon. MARK PEARSON: Are you aware of any aquifers that are functioning very well in Australia at the moment?

Professor KINGSFORD: It is not my area of expertise. It often depends on where you are, so some of the aquifers in inland Australia are pretty sustainable, I think. I do not think I want to comment anymore than that; I just do not know. It is a difficult area because we have very little information about some of those aquifers.

The Hon. MARK PEARSON: In Australia?

Professor KINGSFORD: Yes.

The CHAIR: Thank you very much. We have reached the end of this session. Professor Kingsford, thank you for coming and for all of the incredible work you have done over many decades and for all of your students' work as well. It is very useful for this inquiry. Thank you.

(The witness withdrew.)

BILL WEST, Mayor of Cowra, affirmed and examined

CRAIG DAVIES, Mayor of Narromine, before the Committee via teleconference, affirmed and examined

The CHAIR: Thank you very much. One of the issues we may have is whether Mr Davies just heard that. Did you hear any of that?

Mr DAVIES: I can hear him vaguely, yes.

The CHAIR: We will soldier on then. I am assuming that one or both of you would like to make a short opening statement. I will go to Mr West first.

Mr WEST: Thank you, Madam Chair. I thank you and the Committee for the opportunity to say a few words and to be here. If I may, I reissue the invitation that was part of our submission for you and your panel to come to our region and meet with us in our own paddock. That would be something that I think would be beneficial to all of us. If I can give you a brief snapshot and overview of how we have arrived at this particular point—in 2009 Central NSW Regional Organisation of Councils—Centroc—carried out a water security study that proved there were some deficiencies and significant issues around water security for the Central NSW Joint Organisation area and beyond. That led to 2014, when the Government announced funding to look at water storages high in the catchment, which was part of the findings from the 2009 water security study. It recommended that there needs to be security high in the catchments, given the fact that it was identified that water would become an issue within 30 years for some urban communities.

That rolled on and in 2014 there were conversations across the region about what that might look like and how we might obtain a decent level of water security through a dam high in the catchment. The State Government went through a process of identifying about 15 sites, which were gradually whittled down to probably two. In 2016, there was an upper House inquiry into water augmentation, which the Hon. Penny Sharpe was part of. We visited one of the sites, which was Cranky Rock on the Belubula River. That proved not to be the appropriate place to have a dam for environmental reasons, among others, but the equal choice to look at was Wyangala Dam, which was the one that was landed on, so this is not something that is new. From 2018 the Government has been working towards this particular project.

Councils across our region have been quite concerned about urban security and also the impact of water shortages on the environment and on the social and industrial fabric of our communities and our region. With that in mind, we have been quite happy to see the alleged fast-tracking of Wyangala Dam, bearing in mind that we have always said that the process needs to be followed. We believe that the process is being followed, although perhaps it is unusual that it is being run in parallel—instead of having one program being ticked off at a time, they are doing various stages together, but that still means that there is a substantial process of ensuring that processes are being followed, and things such as EISs and business cases will be formulated before too many final decisions are made. I am happy to leave it there and answer questions, and maybe what else I have to say will be inculcated in the answers.

The CHAIR: Thank you so much. Mr Davies, do you have a short opening statement to make as well?

Mr DAVIES: Yes, just a few thoughts. My concern in all of this matter is less than 12 months after potentially the worst drought that we have seen certainly in this part of the world—and I am almost in the centre of the State—we have a parliamentary inquiry into the imperative or need for dams or water storage facilities and inland rivers. Just so that the Committee is aware, 31 communities in this part of New South Wales were on the verge of evacuation—that is how serious it was out here. Over $15 million was spent, as you are possibly aware, on carting water to communities, which has got to be the most inefficient way of moving water.

There are a number of measures that could be implemented to alleviate some of the issues that are being addressed within this forum, and one of those would be to lift the flood mitigation zone and Burrendong Dam to 120 per cent. This has been explored on numerous occasions. It has been found to be an effective and logical way in which water can be stored. That water is not for irrigators. That water is used on the basis of the allocations that are currently in place. In terms of water usage and the Macquarie River, irrigators get about 17 per cent, urban use is 2 per cent and the rest of the water is environmental.

Most of you will be well aware of the fact that the major environmental infrastructure in this situation is the Macquarie Marshes. It has been mismanaged ever since white man has taken control of it. It is an appalling situation out there. We all believe that it is a wonderful environmental asset, but unfortunately it is not. The only good part of it is a small part that is actually owned by private landholders that has been segregated and isolated, and it is a pristine marsh. The rest of it is basically an irrigated cattle paddock. It is full of carp and wild pigs. To alleviate the issues that you are addressing within this forum, it is not just storages that need to be discussed. It is

a management issue and it needs more than something of this nature to resolve it, but I sincerely thank you for the opportunity to be part of your forum.

The CHAIR: I thank you both very much for your opening statements. We will have questions from the crossbench—myself and the Hon. Mark Pearson—first and then we will go to questions from the Government before finishing with questions from the Opposition. I have a general question in relation to the submission I had before me from the Central NSW Joint Organisation. Mr West, I thank you very much—it is quite a substantial submission. You mentioned at the beginning that the raising of the Wyangala Dam wall was chosen as the best option, and in your submission you say that the raising of the wall has been found to be the superior option after many studies that recommended the need for additional storage, and they analysed a range of long-term infrastructure options. This has been a point of contention with the inquiry in trying to get to where this has been chosen by the Government—which option study said that this was the best option? Where do you believe that has been chosen?

Mr WEST: If we go back to the fact that the Lachlan Valley has been considered as one of the worst performing valleys in the State, water security is a significant issue there for a range of issues. In 2014 there were conversations around looking for sites assuming that there was a large catchment required high in the catchment, and there were a number of sites looked at. Over a period of time they were whittled down because of the area in which they were going to catch water and the diversion yield. They were looking at the practicalities of getting access to the site and being able to store a sufficient amount of water to be reasonable in terms of capital expenditure and capital cost, and also to service the communities and the environment.

It was whittled down to perhaps two or three. The Needles on the Belubula was one of the famous ones mentioned to start with. That was very quickly withdrawn because of the impact that it would have on the Cliefden Caves and the other limestone caves in the region. Over a period of time and after discussions with various State agencies and stakeholders in the region, it came down to Wyangala Dam and a site on the Belubula river called Cranky Rock. They were both looked at very closely in terms of trying to achieve the goal of having a larger storage of water high in the catchment for the broader community. We are talking about being able to help communities such as Orange, who have had specific water shortage issues over a long period of time. They are not in the Lachlan Valley, but it would help them because there is other water from the Lachlan that can be used in local communities, which may be free up water for Orange.

This interconnectivity is something that the councils have been very keen to pursue since 2009. Indeed, there are a series of pipes which have allowed us to move water around the region in critical times, in times of critical human need or if there is an issue with pipes or pumps in a breakdown, being an emergency. It provides that backup, if you like, though not a big one. But if I come to Wyangala, at the end of the day, the Cranky Rock site was ruled out because it had a $1 billion price tag and the geological structure is not suitable for a dam. The one that probably created the biggest problem was an area that was adjacent to the Cliefden Caves and the limestone caves. The councils in the region made a public and private commitment that we would walk away from that option if it looked like impacting on those caves at all, and it looked like impacting.

Whilst they were both probably even in their choice, that is how the Wyangala Dam was chosen, because of all of those factors being included in the consideration, particularly when it came to the choice between increasing the Wyangala Dam wall and the Cranky Rock perspective. I would say that, in terms of Wyangala, it also makes sense where you increase the capacity of an existing dam. One big dam is far better in terms of water storage and less evaporation than having half a dozen small dams.

The CHAIR: Councillor Davies, I will come to you in a second if you want to answer that question as well. Just to explore your response further, so in 2014 there was the WaterNSW *20 Year Infrastructure Options Study*, which clearly stated that it was not a feasibility study or an infrastructure study; it was just a list of options. There has not been a feasibility study into Wyangala as I understand it. Then we were told about a 2018 study by Infrastructure NSW, which again did not say why Wyangala was the preferred option. I suppose for this Committee's sake, which document did it list? How has it been chosen that Wyangala is the preferred option for water security in the region? You talk about conversations and the fact that that has been chosen. Could you please be a bit more specific for the Committee?

Mr WEST: That is a question that I am not in a position to answer. The Committee would probably be aware that I do not have that documentation, but I am certainly happy to go looking for it offline.

The CHAIR: Thank you very much. If you could take that on notice.

Mr WEST: It is something I would stress that has been the subject of conversations with WaterNSW, the Department of Primary Industries and all the relevant departments and the councils. Everybody in the room, including me, in meetings around water, the ROSCCos and a number of other committees that met, and most of

those who have an interest in the water field, including the environmentalists, were engaged in those conversations.

The CHAIR: Could you explain ROSCCos for Hansard? Is that an acronym?

Mr WEST: The River Operations Stakeholder Consultation Committees, which include all of those involved.

The CHAIR: Councillor Davies, would you care to comment on that questioning?

Mr DAVIES: I could not hear any of that, I am sorry.

The CHAIR: Could you hear the question that I posed in relation to the choice of the Wyangala Dam wall raising project as the preferred option for water security in the Lachlan region? Is that your understanding as well? The question was where that has been identified as the preferred or superior option?

Mr DAVIES: No. I must admit that I am not aware of where that might have come from. I tend to focus on my region. Wyangala Dam is on the Lachlan, which is the river below us. I have enough issues to try and resolve in this part of the world. I am more than happy for those in that part of the world to look after theirs.

The CHAIR: I want to focus on Councillor West's submission again. One of the reasons for the Wyangala Dam wall raising was for flood mitigation. Is that correct?

Mr WEST: Yes.

The CHAIR: You talked about the issues in relation to the Newell Highway flooding.

Mr WEST: Wyangala Dam was primarily constructed for irrigation and one of the components of increasing the capacity of Wyangala would be to utilise airspace for flood mitigation. The submission points out that the Newell Highway, which closed for something like 42 days because of the 2016 floods, created a lot of disruption and confusion within traffic moving from Brisbane to Melbourne. The Newell Highway is a significant inland transport and public route. That cost the community a lot of money and, as I said, the road was closed for something like 40 days. If we could reduce that risk by having some form of flood mitigation, by taking the top off the big floods, but not stopping floods, then there is an advantage to be had.

The CHAIR: Are you aware of the work that is being done by Transport for NSW in relation to flood mitigation works on the Newell Highway?

Mr WEST: I am aware of most of those, yes. I am also aware of the flood mitigation report on Inland Rail, in terms of what it said about the Inland Rail as well.

The CHAIR: Just to be clear, I understand the Government has committed $200 million from Transport for NSW for flood proofing the Newell Highway. Is that correct?

Mr WEST: They have committed that money. Whether it will be successful is yet to be seen. You talked of the Newell Highway. I think it is narrowing it down to a single point. You had communities such as Forbes and Condobolin that were also isolated for days on end because of the flood. It is not just the Newell Highway, which was one component at that time.

The CHAIR: But you just mentioned the Newell Highway in your submission.

Mr WEST: The Newell Highway was mentioned as an example of one of the issues around major flooding and the impact it can have. The submission could have gone further and mentioned town such as Forbes and Condobolin.

The CHAIR: Councillor Davies, your submission talks about the Gin Gin Weir and the fact that it will save water for all of those who rely upon it. Can I ask the difference between what is happening now and what the work on the Macquarie re-regulating weir will do, in your view?

Mr DAVIES: Most certainly. Currently there is a structure at Gin Gin, which they call a weir, but it is a structure that was built in 1902 I believe. It fractured many, many decades ago and it has been inoperable for possibly as long as 70 years. It plays no function whatsoever. It is basically just a lump of concrete in the river. With the new weir we will see the opportunity, particularly in times of high rainfall events in the lower parts of the irrigation areas along the Macquarie, where irrigators have the opportunity to be able to ring the water department and say, "Look, I had water ordered, I have 650 megalitres coming down the river, I have just had 75 millimetres of rain and I simply cannot take that water. Can you hold it, please?"

That water will be held at Gin Gin Weir and the subsequent irrigation event will utilise the water behind the weir. Otherwise, that water would simply flow to the marshes and it would be lost to the irrigators. It distorts

the allocations and it means that there is obviously less water for irrigators. Apart from that, one of the main benefits to this is the environment. The fish ladder that will be incorporated into this structure will open up 140 kilometres of river for native species of fish. So it plays a beneficial role not just for irrigators, but it is also an environmental infrastructure asset that will help the environment very significantly.

The CHAIR: Councillor Davies, with the 140 kilometres of river open for fish, where is that information from?

Mr DAVIES: Department of water, as far as I know. I am almost certain it is the department of water. I am actually on the Macquarie infrastructure priority committee, which meets on a quarterly basis. We have not met for some time, though, because of COVID, but the Gin Gin Weir was certainly deemed to be the highest priority amongst that group, which includes environmentalists, irrigators and effluent stream operators further down, so it covers the broader community of the Macquarie and it was certainly deemed to be the most pressing infrastructure requirement.

The Hon. MARK PEARSON: I have a question for both of you. You keep referring to irrigation. What is the irrigation of the water mainly used for? Which agricultural products is that water mainly pumped out for?

Mr DAVIES: I will start, if you do not mind. Irrigation water is typically used on the highest value crop that you can produce with a megalitre of water. That is what determines where irrigation water is used. Irrigators try to use their water in the most efficient manner that they possibly can to maximise their return per megalitre of water that is made available to them. In the case of the Macquarie, the vast majority—and it is the vast majority—would go to growing cotton.

The Hon. MARK PEARSON: If I could just ask a question there: Considering the crisis that we have reached with water, do you not think that the growing of cotton in Australia, and rice, for that matter, is in question?

Mr DAVIES: No, I do not.

The Hon. MARK PEARSON: Why not?

Mr DAVIES: I am not sure what you wear, but right now I have on a pair of cotton pants, a cotton shirt, a cotton singlet, cotton underpants and cotton socks. What more do you want?

The Hon. MARK PEARSON: The question is about where cotton grows, not whether we source cotton or not. I can assure you that I am very much in favour of that as opposed to other products, being from the Animal Justice Party. The question that we are grappling with, and which a lot of environmentalists have put forward, is that we are just going along with the production of cotton and rice, as we have done for a long time, but is it time to question whether that is the wisest use of our water in our particular climate and environment in Australia?

Mr DAVIES: I have just made the point that irrigation water is used on the highest value crop that can be grown. Are you going to suggest to a business that they change their methodology and start producing products that will make them less profit? Because that is what you are suggesting here.

The Hon. MARK PEARSON: They are not before us, but I will finish now anyhow.

The CHAIR: Councillor West may jump in and then we will move to the Government for questions.

Mr WEST: I have a very quick answer to that. We need to make sure that we do not have this conflict between farmers, urban communities, industry, mining and irrigators. They all play a very important role in our society. There was a question to a previous witnesses about the user-pay system. We all need to consider that we all need to pay in some form or other for the food that is being produced in the environment in which we live. We all have a responsibility and that is partly why governments pay tax. Using water wisely is something we should all be doing and we should all be mindful of. Some of the figures I have seen in the Lachlan Valley, they are talking of cotton at about $800 a megalitre, and I take these on advice. I am not quoting them as per the gossip; I have seen these figures.

In the Lachlan Valley they are up to about $1,900 a megalitre for grapes. When you get down towards Hillston, where they are growing nuts and other vegetables, they could be getting to $3,000 or $4,000 a megalitre. It varies on the climate, the soil and the availability of water. But again I stress, let's not have irrigators as the baddies in the tent all the time. We all have a role to play. Conversation and education is the only way we will get to proper, good and sensible water sharing over a year. The increased capacity of dams does enhance the environment, because it allows water to run down rivers that would have run dry and for much longer as part of the water strategy that has been proposed by the Department of Planning, Industry and Environment [DPIE] at the moment.

The Hon. BEN FRANKLIN: Thank you both for being here. I particularly appreciate the comments that you just made, Councillor West. I thought that they were eminently sensible. My questions are to both of you, so feel free to jump in when you are ready. At the first hearing, this Committee heard from the Inland Rivers Network, which claimed that with the recent rainfall the need to build urgent water infrastructure has actually abated, because we have had the recent rainfall. Do you agree with that comment?

Mr WEST: We tend to look at tragedies and natural events that cause concern in this country and when they are finished we tend to forget about them too quickly. Water shortages and droughts will come. They are part of the natural ebb and flow of our seasons. Now is the time to be planning for greater water security. I think the exact opposite; now is the time to be planning and looking at how we can secure our communities into the future, bearing in mind that regional New South Wales and central New South Wales is projected by Infrastructure Australia to be one of the top seven GDP producers nationally by 2031. There are only two in New South Wales and the other one is the Hunter. There is a rural area, which includes both Councillor Davies' area and my area, that is going to produce a lot of GDP for our nation, as well as the benefits to our regional communities, which will help us to grow and also provide support for the cities across the landscape.

Mr DAVIES: Look, as long as the planning that is undertaken prior to the building of dams is very structured and very wise, I have no issue with dams being built. When I suggested to you that the flood mitigation zone at Burrendong Dam could be lifted—for example, Burrendong Dam at 100 per cent full is actually 60 per cent full. I know that sounds a little bit crazy. Above that is the flood mitigation zone, which holds another 700,000 megalitres. Both WaterNSW and all the operators involved in water along the Macquarie agree that the potential to lift the flood mitigation zone up to the 120 per cent would largely eradicate the need for another dam along the Macquarie, because you could then store another 231,000 megalitres in the event of a major flood. Not only does that help with flooding issues, it also helps the environment because, whilst you are keeping some water back in the dam, that water is still allocated in exactly the same manner as all of the water in the river.

Of that 231,000, roughly 80 per cent will still find its way to the environment. Instead of absolutely flooding the marshes and drowning many of the species that are out there, which happens, we have the opportunity to hold back and deliver at a later date roughly 80 per cent of 231,000 megalitres. That has to be beneficial for everyone. The balance of that water is then spread between irrigators and urban, so it is a win-win situation for everyone. But it needs to be a targeted approach where smaller dams could be built simply for urban water and these dams could be as small as 50 gigalitres or something of that nature. It is important that city people understand that we in the bush are just as important as they are down there. If we started saying, "Well, you can get rid of your dams in the city," you can imagine the uproar.

The Hon. BEN FRANKLIN: Councillor, I could not agree with you more. Your point about lifting the flood mitigation zone on the Burrendong Dam is well made. I will ask a question to you both. Putting that aside, and putting aside the conversation and discussion that we have had about the Wyangala Dam wall raising and the Gin Gin Weir, both of which we have spent a little bit of time on, are there any other pieces of infrastructure that you would like to see built for your regions? If so, what are they and why? We might start with Councillor West.

Mr WEST: Very, very quickly—and thank you for that question—firstly, there are some pipelines which are being constructed to assist us in our region. Secondly, there are issues identified in our submission and around other submissions around Lake Brewster and issues that can be methods of helping those around the lower stream and also working with Billaroy Creek and Willandra Weir. But up high in the catchment there is also—and it is part of the draft water strategy—what probably started most of this is the connectivity between Lake Rowlands and Carcoar Dam. There is a proposal to have a pipeline which connects them which will enable water to be shared. That will give Lake Rowlands, which is owned by Central Tablelands Water, a greater capacity to supply urban water back into the community of Orange, in particular.

As everybody would know, Orange has had water shortage issues but they have had a pipe which has connectivity to the Central Tablelands and Orange, which will allow emergency water to flow. Issues such as Lake Rowlands and Carcoar Dam conductivity are also very, very important for our region.

The Hon. BEN FRANKLIN: That is particularly important in times of drought, I would assume.

Mr WEST: It is incredibly important in times of drought. What our region has done a lot of focusing on is supporting our communities in times of critical human needs and emergency situations as opposed to just day-to-day wasting water.

The Hon. BEN FRANKLIN: Thank you Councillor. Councillor Davies?

Mr DAVIES: Yes, most certainly. One of the assets that we have contemplated and have been discussing with the State Government is the proposed Narromine to Nyngan pipeline, which has been discussed ad infinitum now for many, many years. Apparently, now that the drought has broken, it has gone onto the backburners again.

In February of last year we were approached by WaterNSW and their consultants to discuss the potential of setting up a pipeline between Narromine and Nyngan, which is a distance of approximately 125 kilometres, to supply not only Nyngan but also Cobar. In doing so, this would eradicate the necessity of the Albert Priest Channel, which is an earthen channel at the end of the Gunningbar Creek that loses approximately 50 per cent of the water that flows down it each year. That amounts to about 6,000 megalitres per annum. This is a horrendous waste of water when you consider the value of water in this valley and the value of water both to irrigators and to the environment. It is 6,000 megalitres that is basically lost.

We went through a procedure. I guess for a start we were amazed at the lack of understanding that the department of water and their advisers had in relation to how this could be done, where the water could be sought, et cetera, et cetera. We actually devised a plan. We took it to the Minister, who thought it was a great idea. It included the use of bore water from an aquifer just to the west of Narromine that could be tapped into and that could be also put into the same pipeline as the river water to guarantee that the Nyngan-Cobar project had a minimum flow of 4,000 megalitres per annum, which would suffice for their essential requirements out there. That is roughly 11 megalitres a day. For whatever reason, the gurus of WaterNSW decided that that does not work. They are going to find some groundwater elsewhere closer to Nyngan.

Our understanding is that they have found two sites that will produce about two and a half megalitres a day between them, which will give them about 900 megalitres a year when they want 4,000. So we expect they will be back here shortly to knock on our door and say, "What was your idea again?"

The Hon. BEN FRANKLIN: Thank you, Councillor Davies. I appreciate that. Councillor West, can I quickly ask you: Are you planning to make a submission to the Lachlan Regional Water Strategy?

Mr WEST: We already have.

The Hon. BEN FRANKLIN: You have. Excellent.

Mr WEST: And we must say that we have found DPIE quite good to deal with in this matter, both as individual councils on the Lachlan and as a joint organisation—JO. We have had good opportunity to have those conversations and we have made submissions to them. If I can very quickly backtrack on one thing: What we are talking about is dams and regulated rivers. We have two communities or three communities in Orange, Bathurst and Oberon who are on unregulated Macquarie River, and that poses a whole new ball game in terms of water security for those urban towns.

The Hon. BEN FRANKLIN: Apart from the issues that you have already raised and aired today, would either of you like to comment on what you think is missing in the current debate around water infrastructure?

Mr WEST: I think that is a very difficult one. I think all of the information is probably there. It is simply a matter of having the opportunity to sit down and to go through it and ask supplementary questions as we come up with comments or thoughts that we think may or may not satisfy the rationale in our own minds. I think a lot of information is there but I think—and I think I alluded to earlier—one of the issues is that we tend to be a little bit entrenched in our own focus on our own world. This education and engaging in conversations I think is a way to resolve most of those issues. I do not think it is going to be terribly difficult but it just needs to have a conversation, which does allay most of the fears. There will be some things where there has to be a conscious decision made but I think that we all will benefit from that kind of a conversation. I think there will be a lot more winners than people think there will be.

The Hon. BEN FRANKLIN: Thanks, Councillor. Councillor Davies?

Mr DAVIES: Yes, I guess that my thoughts would simply be that much of the conversation has occurred already. It is the lack of action that concerns me, particularly in relation to a pipeline that would connect Nyngan and Cobar. This has been on the drawing boards for decades, basically. They are wasting water in the current methodology that is used to transport water to those towns. A very logical alternative is available. We have had a bit of rain. It is all on the backburner and I do not understand why.

The Hon. BEN FRANKLIN: Righto. Thanks, Councillor Davies.

The CHAIR: Questions from Ms Cusack.

The Hon. CATHERINE CUSACK: Thank you. In your submission you talk about economic growth in the region. Have you looked at what would be a sustainable population in the region? Is there a number or a ceiling on how much you think—

Mr WEST: I guess—I do not mean to be flippant—that is with or without greater water security? In terms of some communities, there are issues around infrastructure and other communities have not issues around infrastructure at the same magnitude. In my community around Cowra we could double our community. I know

the Department of Planning, Industry, and Environment are projecting the communities of Orange and Bathurst, for example, to increase by about 20 per cent by 2041. So population growth will continue but the potential is there for a significant increase in population.

The Hon. CATHERINE CUSACK: This is what I am trying to understand, though. Is that a desirable thing to double the population? Why do we want to double the population?

Mr WEST: I think you get a critical mass where it becomes efficient and effective for governments to provide services and for communities to be able to provide services cost effectively. But I think if we are going to increase the population of New South Wales—and Planning is predicting three million, I think, by 2041—we are suggesting that 2.7 million or 2.8 million of those are going to live in the metropolitan area of Greater Sydney. I would counter your question by saying: Is that sustainable and desirable population as well? I think there is an opportunity to have both—an opportunity to increase population in rural and regional areas, create jobs, create growth, create wealth, which would be to the betterment of all our communities. I do not think, as I say, 2.8 million people into Sydney, the cost that is going to incur, is not necessarily easy.

The Hon. CATHERINE CUSACK: I guess I am just asking: Have you actually looked at what is the correct number, the sustainable number? Does your planning—does, for example, raising the dam wall and working out how much more water that will give all fit into a plan where there is actually an aspiration for a particular population? Is there a point at which it would become negative to have more people? We are all talking about the difficulty of sustaining a community in a drought and just maintaining that community? Are we doing infrastructure for security for them, or is this kind of an uncapped growth figure? They are two different tasks, it seems to me.

Mr WEST: I get the gist of your question. In terms of an aspirational figure, I do not think anybody from the Department of Planning, Industry, and Environment down to anybody who has really looked at what an aspirational figure might be. In terms of increased water capacity providing the opportunity for growth, certainly it will do that. Communities in rural/regional areas are declining. In some areas and in some cases, they are growing. I do not think it is going to be of any value to anybody if rural communities are left to wither and die on the vine. One of the ways that that will become far more sustainable will be by having good infrastructure and good natural resources, energy, power, water and those sorts of critical needs. I am beating around the bush because I do not think anybody has sat down and done that particular piece of work, which is probably one that we should be seeking to do.

The Hon. CATHERINE CUSACK: It has been argued that water utilities in the Lachlan only about 2 per cent of the allocation. So, raising a dam wall and the extra capacity that will give, how much of that you envisage going to water utilities?

Mr WEST: We currently have licences, so that will remain the same. There is no suggestion and there has been a commitment from the Government, actually. We have increased capacity at Wyangala not to increase licences or water; it will get more security, more certainty. It depends on what part of the Lachlan River you are on. It would be the same with the Macquarie. If you are in the high end of the river then the water security is far greater then down the bottom end, down around Lake Cargelligo and further downstream. More water and greater security will provide the river to run longer and more often, which gives them the security—

The Hon. CATHERINE CUSACK: The prime beneficiary is really going to be industry in terms of security of water for industry. Should industry be, on a user-pays basis, contributing to the cost of that infrastructure?

Mr WEST: I have no doubt that industry should be paying something, but as I was trying to allude to earlier there is a need for a broader conversation about what user-pay might look like. That includes what we pay for the goods and services that are produced, the value that comes out of our exported products and how that can be passed back through to the bigger picture, if you like, whether the person who is a manufacturer or a provider has to pay the lot up front and recoup it. That is a conversation we need to have, but I do not think it is fair to say, "You are using 10 dollars' worth of water, you have to pay 10 dollars" when somebody downstream is getting significant benefit for nothing. That is a convoluted answer.

The question I would pose: I look at the lighting here and the lighting is coming out of maybe coal power generators, it may be renewable. Whatever it is, it is coming out of rural and regional New South Wales. There is a benefit for all of us in what we do. Somehow we have to inculcate that benefit and our thinking into user-pay.

The Hon. PENNY SHARPE: Councillor Davies, I have a couple of questions based on your submission. The level of frustration you have around the debate comes through fairly clearly in your submission. I want you to comment on two things. First, what are your concerns about the way this debate has been framed in

your area? You say that there is a lot of misinformation. Will you tell the Committee what you believe that misinformation to be and the facts as you see them?

Mr DAVIES: The misinformation basically comes from a discontented group in Dubbo who have decided that they need to have input into areas of operation of the Macquarie River, of which they have absolutely no understanding. They have been able to get the Conservation Council of NSW on board, who have spent literally tens of thousands of dollars in the local press saying that all these nasty things were going to happen when the Gin Gin Weir was established and built. It is so hypocritical that people who have no idea get all this airtime and all the press. I find it incredible. I want to go back if I could to the opportunities that exist in these areas. We have inland rail coming through our shire in the next five years, we believe. If that is the case, the opportunities that will present from the advent of inland rail are enormous.

Already, we have a site for a freight exchange hub that will be part of inland rail and our expectation is that there will be 200 jobs created on that site. That takes water. We have other aspirations within our shire. We are developing a high-tech aviation space at our aerodrome. We currently have 22 sites available at the aerodrome for aviation-related industry. We have a company called AMSL who have a vertical take off and landing aircraft being developed and tested at this aerodrome. We have a number of Korean companies who have similar technology. One has an airship that is 11 metres by three that carries technology under it that can cling into the earth's crust to a depth of 200 metres and is unique in the world. For us to grow, we need water. If we do not grow, we stagnate, the value of our real estate goes down, we lose our smart kids.

We do not want to be like that. We want to be in a position where we can offer good jobs to young people, high-tech jobs, well-paid jobs. We want our areas to thrive, and we believe that we have that right. When we are only using 2 per cent of the water that is available from these rivers, we are not overstepping the mark in terms of our consumption. The other point that needs to be made, just very quickly, is that the Macquarie River has been over-recovered in the water sharing plan by 92,000 megalitres. Now, I am not sure whether you people are aware of that. We have had 92,000 megalitres recovered that was not part of the water sharing plan and to this date we have yet to find consensus among government and the Commonwealth Environmental Water holder as to how that water can and should be returned to this river.

The Hon. PENNY SHARPE: Yes, I am vaguely aware of that, Councillor Davies. You have actually touched on my next question, which was the importance around jobs growth and the need for water, but you have spoken to all of that. Councillor West, I was interested in the submission where you made some comments around the benefit-cost ratio approach being used for Wyangala Dam. It sounds like there has been a bit of to-ing and fro-ing. Could you take the Committee to where the joint councils are with it, whether you have concerns and what they are.

Mr WEST: Can I indulge to ask what page?

The Hon. PENNY SHARPE: Yes, page 14.

Mr WEST: The broader context that we look at benefit-cost ratios is that they tend not to capture social benefits as well as they could. Benefit-cost ratios in rural and regional areas tend to, we think, disadvantages because we simply do not have the population base. We argue that there needs to be some sort of social capital considerations given to benefit cost ratios. The general consensus is that there is a benefit to the much broader community, not just the local and regional community but the broader community, that should be considered as part of the benefit-cost ratio or providing some form of financial input into this sort of a model.

The Hon. PENNY SHARPE: And your submission says that the funding mechanism is changed in version two, which was the funding in the Safe and Secure Water Program that gave it more flexibility. Can you tell us what the change was and what that has allowed consideration of?

Mr WEST: When we are talking about Safe and Secure, it is a different bucket, obviously. It is a different funding process, clearly. You had me worried for a minute. I did not pick that up. Safe and Secure is about providing rural and regional communities. We were able to really convince people in government that for small communities the benefit-cost ratio needed to be adjusted to allow for critical human water needs. I think someone mentioned earlier about the cost of carting water alone—

The Hon. PENNY SHARPE: Yes, $15 million.

Mr WEST: There needs to be a consideration for that social benefit for small committees who perhaps do not have the capacity always to fund these things on their own.

The Hon. PENNY SHARPE: We touched on it before, but what is your understanding of who is going to pay both for the raising of the wall and the ongoing maintenance? What is your understanding of where that cost is going to be recovered from?

Mr WEST: Apart from the Feds talking of putting in $230 million, we are still waiting on the business case to come forward to inform us of that. That is a similar position that Lachlan Valley Water also have, in terms of the business case, we would assume it will provide that level of detail.

The Hon. PENNY SHARPE: It will wait for the business case to provide—you believe that information will be in there.

Mr WEST: The information should be there and if it is not then I am sure the councils, the irrigators and the environment and everybody will be looking for that pretty quickly.

The Hon. PENNY SHARPE: Yes, I think that is right. It seems to be a fairly key part of the whole thing.

Mr WEST: Yes, "Who is going to pay?" finishes up being a good question.

The Hon. PENNY SHARPE: That is right. I am quite familiar with how we ended up getting to Wyangala—you outlined that to the Committee and, as you know, a few years ago I was involved in the Belubula and Cranky Rock inquiry and having a look at that. After having had a look, Wyangala seems to have been chosen as the best one for what you believe was there. It has a price tag of $650 million and there have been reports that it could be significantly more than that. Do you have any sense around that or, again, are you waiting for that to come out in the business case?

Mr WEST: I am waiting for that to come out. There has been all sorts of speculation around figures which, to be frank, I think is unhelpful. There will be offsets of some sort, I imagine. Whether $650 million will be sufficient, that is not in my remit of expertise or knowledge to even try to hazard a guess at. In terms of the dam, I make the observation that the Lachlan Valley is 90,000 square kilometres in area. The dam has a catchment capacity of 8,300 square kilometres. So there is a lot of area below the dam. One of the comments my colleague in Narromine made was about misinformation. I would not call it misinformation, but I think something that is probably not put out there is that there is a lot of water fall below the dam that is not being run free through the environment, to farmers, that fills up dams and aquifers and all those things.

The Hon. PENNY SHARPE: Are you concerned that that is not going to get picked up through the EIS process? Are you worried that the framework does not take that into account?

Mr WEST: As I alluded to a minute ago, I am concerned that it will be a difficult job to sift through all the information and sort—in old farmer terms—the wheat from the chaff. That will be difficult because, even though there is a lot of genuine and reasonable interest, it can become—the waters have been muddied, if you like. Therefore, it can be difficult to get through to the outcome.

The Hon. PENNY SHARPE: In your neck of the woods around Cowra, what are the population predictions over the next—

Mr WEST: The Cowra population is anticipated to increase from about 12,600 to about 12,800 in the next few years. With no disrespect to the Department of Planning, their figures have been notoriously inaccurate, so we are working on something.

The Hon. PENNY SHARPE: Yes, I think we would all agree on that.

The Hon. MARK BUTTIGIEG: Are they inaccurate on the downside—in other words, underestimating the growth?

Mr WEST: No, they have just never been accurate. The last figures they did for Cowra in about 2018 said about 11,400 by now and I think we are about 12,600.

The Hon. PENNY SHARPE: Have you seen—there seems to be a change in people moving back into towns across New South Wales around the impact of COVID and people leaving the city. It is anecdotal and probably a bit early to tell.

Mr WEST: Visitor numbers have gone through the roof, which is great. Real estate is hot—there has been a significant increase in their price of real estate—and there is a great shortage of rental properties and houses coming on the market. So there is a movement in that area. Talking to my colleague in Bland, which is in the Lake Cowal area, I think they said there were about two houses on the market at that particular time—about two weeks ago. So, yes, there is population moving into rural and regional areas.

The Hon. MARK BUTTIGIEG: Mr Davies, you touched on some figures in your opening statement. I think you said 2 per cent was for town water, 17 per cent was for irrigation and the rest, roughly 80 per cent, was for environmental. I think the implication was that that was being chronically mismanaged. Basically, is it your position that if that 80 per cent was much better managed a lot of the problems would be solved?

Mr DAVIES: I just think that it needs someone a whole lot smarter than me to have a good look at the way that it is managed. When I suggest 82 per cent, that is the balance of the water that is not used by either irrigators or urban. I understand, as we all do, that some of that is simply lost in the management of the river. Again, my understanding is that potentially 140,000 megalitres per annum is lost in the system of just running the river. That clearly happens on all rivers. But we are looking at a situation where I believe—and I think it is the belief of most people—that when you only have 17 per cent allocated to productive agriculture or irrigation, then the notion that that we always get of irrigation using too much water is a fallacy. If the water that goes into the Macquarie Marshes was managed properly, it could be done a lot more effectively and efficiently.

The only water that is not measured within this system—and I believe all systems in New South Wales—is water for the environment. The other aspect to all of that is that we do not measure the outcomes of those environmental flows. We do not know the benefits that we are getting from flows to the environment and that is wrong. When a farmer has to account for every last megalitre of water that he uses, that is fine. But to have 200 people running around checking on his meters to make sure he is not pinching water, yet the environment gets all this water thrown at them with absolutely no accountability, that is wrong.

The Hon. MARK BUTTIGIEG: Fair enough, that is very helpful.

The CHAIR: Thank you both. We are out of time for the session. Thank you for making the trip for this hearing, Mr West, and thank you for enduring the technological difficulties we have had, Mr Davies.

(The witnesses withdrew.)

(Short adjournment)

CLAIRE MILLER, Chief Executive Officer, NSW Irrigators' Council, affirmed and examined

CHRISTINE FREAK, Policy Manager, NSW Irrigators' Council, affirmed and examined

The CHAIR: I apologise on behalf of the Committee and the Parliament for the audiovisual difficulties we have had with the hearing today. Hopefully, things will be a little bit better from here on in. I welcome our next witnesses from the NSW Irrigators' Council to the hearing. Would either of you care to make a short opening statement?

Ms MILLER: Yes, I will make a short opening statement on behalf of the council. We wish to start by recognising that water infrastructure has been and always will be a topic of great debate because it will inevitably involve trade-offs that are confronting. However, with an issue as critical and pertinent as water security, this is an essential conversation. Water security is of importance to all water users, including towns and communities who need drinking water, water to wash in and sewage and wastewater; the environment and ecosystems that depend on our river systems; and industries, such as irrigated farming, that rely on adequate water storage and efficient delivery to produce food and fibre for Australians and beyond. Water security is the most significant issue affecting our farming sector and regional communities.

The recent drought, which remains ongoing in many regions and will continue to prove a long road of recovery for many, highlights that a changing climate presents confronting dilemmas that require an objective and informed conversation on what we must do to improve our resilience. Climate change is already having and is projected to continue to have significant impacts on inland waterways through warming and drying trends with longer, hotter, drier summers interspersed with fewer wet years and more intense rainfall events. Those trends place increasing demand on water infrastructure to supply water through longer periods of drought.

As a fundamental principle in a nation with such a variable climate we need the ability to store water in which times to endure the dry times. We must also recognise that water infrastructure is multipurpose and its role is also changing. In recent times, following water reforms such as the Murray-Darling Basin Plan that involved the purchase of more than 20 per cent of irrigation licences that are now held for the environment, dams have an important role to store this held environmental water and use it in dry times to provide river connectivity and to allow water to be delivered to environmental sites.

This is not about any one particular user. This is about how we ensure the security of the total resource. The perspective of the irrigation industry, which is the last in line to receive water and the first in line to have the tap switched off when it turns dry, the ability for our farmers to grow food and fibre to be consistently available on supermarket shelves rests on the ability to secure water. Recent Australian Bureau of Statistics statistics show that irrigation provides Australia with more than 90 per cent of our fruit, nuts and grapes, more than 76 per cent of our vegetables, 100 per cent of our rice and more than 50 per cent of our dairy and sugar.

The irrigation industry has a lot to lose from climate change and the adequacy of water infrastructure to allow all water users to endure such periods. The terms of reference for this inquiry focuses on a number of individual projects and as a membership-based organisation for questions on these specific projects we refer you to our relevant member organisations in those areas, many of whom have provided submissions and already appeared before you. From the perspective of NSW Irrigators' Council, when it comes to infrastructure to serve water security all options should be on the table and must be assessed based on their merits, critical analysis of the cost and benefits and objective determination on the best way forward. Thank you.

The CHAIR: Thank you very much. Ms Miller, you finished your opening statement by talking about the options and making sure that all options are on the table. Do you think that the choice of, for example, raising the Wyangala Dam wall when the draft Lachlan Regional Water Strategy has not been released and when Infrastructure NSW has not recommended any option for the Lachlan, do you think this is premature of the Government to recommend this project go ahead—or to approve this project?

Ms MILLER: I am reluctant to speak on specific projects when I know that Lachlan Valley Water has appeared before you and provided evidence on this. It is really the subject matter expert on that particular project. But as a general principle I think it is possible to have concurrence there. The business plan for any of these projects takes many years. They do have to work through all of the merits and all of the pros and cons and this actually would be running concurrently with the development of the Regional Water Strategy as well. Presumably that process would be able to inform the ultimate decisions on whether or not to go ahead with those projects.

The CHAIR: Is the Irrigators' Council aware of studies such as hydrological modelling studies being undertaken before various options are considered or approved? Would that be the usual course of action?

Ms MILLER: I would assume that hydrological studies would be absolutely key to looking at the cost benefits of any infrastructure project of this nature.

The CHAIR: Ms Freak, as a policy adviser for the Irrigators' Council what is your view on that?

Ms FREAK: I agree with what Ms Miller said. I think every option needs to be considered objectively and based on its merits. Part of that is having all of that available information to inform the decision. So in the case of Wyangala, as you referred to earlier, we of course need to refer to our member—Lachlan Valley Water—and their submission. What they have said in their submission is that Lachlan has low drought security and also low flood management capability so in that case we do need a thorough assessment of what can be done for that valley in order to address those concerns. That involves a thorough business case and things such as hydrological modelling as you suggest to make sure the best possible way forward is determined for all water users in that valley.

The CHAIR: So, in this situation, the Government has chosen Wyangala Dam wall raising even though Infrastructure NSW was very clear in its options study that it still required further investigation and they chose not one particular option. No business case has been released, we understand hydrological modelling is currently being undertaken with the Government stating it is due to be released some time this year, so it would appear that the Wyangala Dam wall raising option was chosen before the business case was done and before hydrological modelling was undertaken. Quite unusual for something to determine something for water security in a whole valley, is it not? To do that before those two have been complete?

Ms MILLER: From my experience, I can understand what you are saying because there is that question of chicken and egg. We have a water security problem in that particular valley, in fact we have water security problems pretty much everywhere. Take your pick on what they look like. But it is not inconsistent to me that they might say this is a project that we want to pursue and that we want to look at. Then you do the business case and then you do the hydrological studies. Then you come back and the ultimate decisions are made based on the information that is provided.

You can do the business case and the hydrological studies to inform the project but in doing that you are putting it out there as a proposed project to begin with. So whether you announce it first and do it afterwards or do the work first and then announce it afterwards, the mere fact of beginning the work means you will get that media headline saying this is something the Government wants to do. Where we are sitting is that there is a process in place for evaluation. It should be an informed decision that considers the pros and the cons. All of these types of projects have negative and positive benefits and ultimately there are trade-offs that have to be made. But as far as we are aware we are comfortable that the work is being done to make sure that is an informed decision at the end.

Ms FREAK: One thing I will add to that is I think it is important that the business case and all the modelling is made publicly available so it is transparent and can be externally scrutinised. That is part of having the robust, decision-making process. As Ms Miller said in her opening statement, this is not about any particular stakeholder but all stakeholders need to be able to have a look at this information so that they, alongside decision-makers, can make the best decision.

The CHAIR: So what if, for example, the hydrological modelling or the business case determines that Wyangala Dam wall raising is not the best option? That is an option isn't it that might happen?

Ms MILLER: Of course. Saying no is always an option.

Ms FREAK: We have not seen the business case so—

Ms MILLER: Exactly. We have not seen the business case so that would be speculation at this point as to whether—

The CHAIR: But you did say potentially then it was just a headline because the Government has said very clearly that they are going to raise this dam wall. There is a website for it, a webpage for it that says they are going ahead with it.

Ms MILLER: Sorry, let me just correct that. I was probably being a little bit flippant in saying a headline. Sorry, I am a former journalist so I tend to think that way.

The CHAIR: You know how it works then.

Ms MILLER: No. We know that this is the preferred project for the Government. We know that this is something they wish to pursue. But nonetheless there is still a process that is underway to do a business case, to do the hydrological studies, all of the information and we would trust ultimately that will inform the decision.

The CHAIR: Okay. I will leave that line of questioning there. I want to talk about irrigation efficiency which I am sure you are very across. I understand that the Lachlan Valley has not really benefited as much as other valleys in relation to the $13 billion I gather the Commonwealth's Murray-Darling Basin Plan spent. The Lachlan early on basically had some of the licences bought out—a big block of licences—so therefore did not receive much in terms of irrigation efficiency. Firstly, is my understanding correct?

Ms MILLER: I will just refer that to Ms Freak.

Ms FREAK: I will have to take that one on notice as to the uptake of the efficiency programs in the Lachlan but I can make some more general comments about the irrigation in the Lachlan.

The CHAIR: It would be good if you could take that on notice because my next question was that we have had a number of submissions that there is a Commonwealth report. Professor Jamie Pittock mentioned this at the last hearing. He understands that they undertook an assessment in 2009 that looked at the potential for irrigation water efficiency in the Lachlan Valley and that this report said that upgrading the irrigation infrastructure—because the Lachlan Valley has missed out on a lot of this spend—could serve around 25 gigalitres. In 2009 it was at a cost of $170 million. Of course, we know that the figure for the Wyangala Dam wall raising is 25 gigalitres. In terms of irrigation efficiency in the Lachlan Valley, Ms Freak, could you expand on the options or opportunities there?

Ms FREAK: I think that in the Lachlan there is a very significant problem of underuse. Irrigation in the Lachlan is well below the sustainable diversion limit already at this stage. What we need to look at for the Lachlan is actually options that can allow irrigators to be using up to and equal to that sustainable diversion limit. In terms of looking at those sorts of options, if we look at the basin plan legislation and what needs to happen to work within the framework, it is actually a rising of water usage for that particular valley and a number of other valleys in New South Wales at the moment too.

The CHAIR: So a rise in use, but that does not mean in terms of climate change and decreasing water supply that we therefore do not look at using water more efficiently. Instead of looking at requiring a further additional take upstream in the dam, is it not the whole point of water efficiency that we capture that 25 gigalitre potential on farm instead of on storage? Or are you suggesting the water efficiency measures are not necessarily needed because the Lachlan Valley is already below the sustainable diversion limit take?

Ms MILLER: What has happened in the Lachlan Valley is several things. Firstly, when the buybacks were done before the basin plan was actually signed—the bulk of all of those buyback tenders occurred through 2008 to 2011. That was before the basin plan came out and it set sustainable diversion limits and therefore recovery targets by valley. Once they got to that point in the basin plan, more water had already been purchased in the Lachlan than was required to meet their water recovery target. In that sense, they are over-recovered. That would be one reason why they have not benefited then from funding for water efficiency projects, because all of those water efficiency projects were tied to—basically it was a trade-off deal: "You do the work on your property and in return you transfer some of your entitlements to the environment." But it was not needed for the environment at that point because they had over-recovered through buybacks.

In general though, because of climate change and because water is reliably unreliable in the Lachlan Valley—it is very much one of those feast-and-famine systems—the irrigators are already highly efficient. They have to be to make the best use of the water they have got because they do not often get it, to be blunt. While there is always capacity for greater water efficiency and greater efficiency of works and so forth, they are already very efficient. Scarcity is a good mother of invention and a good driver for investment and efficient works already. The other part too is that annual averages in Australia do not mean anything for rainfall. We could get an annual average equivalent of 21 gigalitres of water-saving through doing these border projects. Would that therefore translate to an annual average of 21 gigalitres sitting in the dam up the top?

Probably not, because a lot of the water that they use is run through river. It comes from tributaries below the dam. It would not necessarily mean that you have more water left up there in the dam. The other thing is that it is an annual average, so most years there is nothing. Other years they are underwater.

The CHAIR: You have just talked about the fact that the water has to come to come from other places. Let us use the 21 gigalitres as an example. Quite a few witnesses to this inquiry have talked about the fact that more dams will not create more water and that it has to be taken from other users on the system. Being the NSW Irrigators' Council, which represents irrigators across the State, do you have any views around the dams that are in question before this Committee inquiry and where that water is going to come from within the system? Who will be the losers? I am sure that potentially some of your members are worried. Obviously, some will support the dams, but surely other users in the system will also miss out. Do you have a general comment about that?

Ms MILLER: Every project is going to have trade-offs. They always do. It is always a question of balance. We know that there is general support from the Lachlan Valley users' association. They represent the vast majority of the water users in that valley. They are supportive of this project—or at least they are certainly supportive of the business case being done and all the information being provided. Obviously, when there is a dam that has any project that captures more water, the question is whether that means someone downstream has missed out because more water is being held back. Probably not. Again that is all about management of the water that you have. This is about trying to capture a bit more water in those very wet years to provide better security in the very dry years. That is to the benefit of towns through the Lachlan Valley. They rely on this as well.

I say the Lachlan is reliably unreliable in terms of its water availability for irrigation, but it is also notoriously unreliable for enough water to even run the river. It takes vastly more water to keep that river running. For the environment, when you only use entitlements, they are just as unreliable as the—they are irrigation entitlements. If they are not getting an allocation as well, then you are going to have less water available to maintain your environmental values through that valley. Again, you look at trade-offs and ask whether you can get a bit more reliability by holding back more water when it is super wet in the dam. Then in the long run that could keep those rivers running longer. That is to the environment's benefit as well as to productive capacity and also provides greater security for towns downstream. Obviously, that gets traded off against inundation above the dam. That issue needs to be examined.

Ms FREAK: I think one thing that is important to add is that these projects, to my knowledge, are not about creating any new entitlements. It is about adding to the reliability of the existing entitlements. That is very important to the integrity of the whole framework. In that sense, that goes to addressing third-party impacts. I will add that, under New South Wales legislation, there is the order of priorities for water usage. I think we need to ask the flip side of the question about who is going to miss out if projects of this kind do not go ahead or if they are delayed. The way the order of priorities is structured—it is section 60 of the Water Management Act—it has got towns and critical human needs at the very top.

Secondly, it is the environment and, thirdly, we go down into all of the other uses with the general security irrigation entitlements at the very end. The reliability of the entitlements for irrigation is what is most at stake from the way we manage our water, particularly water infrastructure, to have that supply of water. This is why this water security and these infrastructure projects are so important to the irrigation industry because, as Ms Miller said in the opening statement, we are the first to have the water turned off in a dry time and when there is not enough supply to meet those higher priority needs.

The Hon. BEN FRANKLIN: To pick up on that, you would contend, I assume, critical not just for critical human needs and employment—agriculture, irrigation and so on—but also for the environment?

Ms MILLER: That is correct. When you look at the millennium drought, it is important to look at what happened in the Murray system. The southern Basin has the benefit, historically, of these massive storages that have been built up into the headwaters. There is something like 14,000 or 16,000 gigalitres of storage capacity and they fill fairly reliably because of the mountainous nature of the catchments. In the millennium drought it was not until about 2006 that finally the impact of that extremely dry period—running for about eight years by then—started to be felt where the catchments dried up in the mountains and the storages stopped filling. Had you not had those storages up there the Murray River would have stopped running for several months during summer in 2008 and in 2009. That is a fact.

But because those big storages were up there—it was pretty brutal; we had very low allocations for environment. They had to bring in special rules that were that the river has to run first. The water goes first to keep the river running, because we had towns, stock and domestic that need to be supplied. There are obviously environmental benefits that go with that river continuing to run. Once again, irrigators were at the very end of the food chain there, but they still managed to have enough water left over, even at its most desperate in 2008 and 2009, for the small allocations against high security—obviously the general security guys were at zero. But what I remember a lot about that period, too, was there was already enough water sitting in held environmental water accounts that they were able to water drought refuges to keep alive endangered fish and other species going through the drought. We would have actually lost the hardyhead fish, which I know no-one has ever heard of.

It is about this big, but it is endangered and it is an important part of the ecosystem and the food chain. It was down to only five shrinking pools of water, basically. South Australia just could not get water into its three. Victoria was the last place, and water was assigned to go in there to keep those fish alive—and we did. Obviously irrigators were unhappy, because they were also desperate for water. But the point is that because we were able to keep that river running—because of those big dams up in the hills—you could get water down to keep the hardyhead fish going. Nothing is ever straightforward, is it? There are pluses and minuses here. Greater water security means that the $13 billion we have spent on acquiring irrigation entitlements for the environment to boost

the water that it already gets through run of the river, which is the majority of the water that is available—we in the NSW Irrigators' Council are keen to see that their reliability is boosted as well, for the sake of the environment. They are the same type of entitlements that irrigators have as well.

The Hon. BEN FRANKLIN: You would obviously be aware, I am sure, that the Government has now released six draft regional water strategies; I am sure you are on top of all of them. How has the climate modelling in those strategies impacted on water security and on the need for additional storages in regional New South Wales?

Ms MILLER: I might refer this one to Ms Freak, who has been spending a lot more time reading.

Ms FREAK: The information that has come out with the regional water strategies in the climate modelling predictions is very confronting for the irrigation sector. There are some pretty shocking statistics that come through those, such as in the Lachlan where, if that worst-case climate scenario eventuates, it would be a 60 per cent reduction in general security reliability. That is huge. That also means the 60 per cent reduction in those environmental entitlements as well. This is such a critical concern for everyone and every water user. We need to have the capacity to store the water to try to offset those incredibly severe potential impacts on entitlement reliability, because if that is what is happening at the bottom of that hierarchy we can only imagine what is happening further up in dry years.

We saw that in the most recent—and, in many places, ongoing—drought, where not only was the bottom of that hierarchy essentially switched off for three years with zero allocations but we were getting right up to the top, where even those critical human needs in many towns throughout the Hunter and the Northern Tablelands were also going without water and having water carting on trucks. I think that just presents the severity of the situation—we must make sure that our water infrastructure at least keeps up with population growth, so that we can maintain the reliability of those entitlements at the top but also not risk losing the supply of water for those high priority needs. Things like towns cannot afford to take a 0 per cent hit. They need that for the survival of the town, to be very frank.

The Hon. BEN FRANKLIN: In order to achieve those important motivations, you would contend that we need additional storage in regional New South Wales and that that is the strategy that should be followed?

Ms FREAK: I think we certainly need to look at all options, particularly with infrastructure. I think what you will see in our submission is we have put together a graph of water infrastructure development in New South Wales. What we see is that there is a trend of development of increased storage capacity, which then begins to stall and plateau around the late 1980s. During that period we still have a population growing. That population not only needs it for their consumption but also for the food production to sustain that population. Then you add in climate change on top of that and I think it certainly presents a problem. I guess, at the end of the day, we need supply to equal demand.

Ms MILLER: Can I just add to that that storages come in many forms. You build dams where it makes sense. You raise the wall where it makes sense. It is not going to be the answer in every situation, however. There are multiple other ways of doing storages. That is what we mean by "all options on the table". Do you look at off-river storages, for instance, rather than relying on weir pools for town supplies out in the Far West? Do you look at shallow aquifer recharge systems to try to boost those during the very wet periods so that you can then draw back on that sort of aquifer more in the dry periods? There are multiple technologies and systems all around the world. This is a global problem.

I do policy work for the International Water Resources Association, and this is a very hot topic all around the world: how to manage in a climate change future, where some regions will be wetter, which brings its own very serious issues such as groundwater contamination risks and so forth, and many areas like Australia on the bands where we are facing a much drier future. When we say all options need to be on the table and we talk about the benefits of storage, there are many types of storage that need to be explored that are fit for purpose or may be a better fit for purpose for the particular geology or region that we are talking about.

The Hon. BEN FRANKLIN: There is certainly no one solution for this issue. I will move to another topic. There has been a lot of discussion about the need for river connectivity. Can I ask what your understanding is of the term "connectivity", and how important do you think it is for river health?

Ms MILLER: It is an interesting one, is it not? It means different things to different people.

The Hon. BEN FRANKLIN: Exactly.

Ms MILLER: Connectivity can mean you wish to keep—let us take the Barwon-Darling as an example. Again, it is an ephemeral river system. Feast and famine is typical and, unfortunately, the famine periods—the dry periods—are getting longer and the wet flooded years are fewer and further between. Can you keep that river

connected, in an ecological sense, as in the river runs as long as possible? There are already measures that are in place that, when there is water coming down it, to try to keep it running and to get it connected. The first flush event earlier this year is an example of starting to look at what active management might look at for that purpose. Others see connecitivity as meaning as little water as possible is diverted for consumptive purposes upstream in order to get the maximum volume down to the bottom of the system so that someone else can divert it for consumptive use. That is a quite different concept of connectivity. I guess that this will be a policy question that will be debated. Ms Freak, did you want to add to that?

Ms FREAK: I can add to that. I guess it comes down to the difference between rivers like the Barwon-Darling, which are unregulated, and other systems which are regulated, and having those headwater storages gives the ability to manage a river system and to control those flows throughout the dry periods. We need to look at this as a uniquely Australian context as well. So much of the understanding of rivers comes from understandings of rivers across Europe and America, and those rivers are characterised by big alpine mountain ranges at the top, and that snowpact gives the ability for a river flow to be connected for most of the time. But in this Australian context, and particularly with the Murray-Darling, the headwaters of the Murray-Darling Basin is essentially a desert and it is flat.

What that means is there is a very small ability to control a lot of those river systems, because it is highly dependent on rainfall and inflows. So as water managers and people who seek to manage these river systems, that is a fundamental conundrum that, in many ways, cannot be overcome unless there is those inflows, but having water infrastructure gives the ability to control those flows as much as can be done with the rainfall during those periods.

The Hon. BEN FRANKLIN: Is it possible in Australia in the context that you have just raised, particularly in periods of drought, to achieve connectivity without dams and weirs and things like that?

Ms FREAK: Ultimately it depends on the rainfall. If there is no water then water cannot be managed. The position that we were in just 12 months ago, particularly around areas of northern New South Wales—you could fly across it and the landscape was just barren. It had gone from brown to grey and dusty. In that context, there is no water to provide for connectivity. If less water is stored then it cannot delivered.

Ms MILLER: Also we have those big dams that are in historical legacy down in the southern basin, but you do not have big dams up in the northern valleys in the basin. That, as much as anything, is to do with the fact that they are not mountain ranges—they are not very big and are not huge catchment areas. Also can keep all those rivers connected even if you were inclined to spend a lot of money trying to build bigger dams up in the headwaters there, which has very different topography and rainfall patterns to the south? You then have to deal with a very flat and hot landscape that the water flows across, and you have a number of inland deltas.

People seem to think that the water goes down single river channels, but in the Gwydir, for instance, it comes down the main river channel and then around Moree it splits out into multiple channels. It is an internal delta and any inland delta like that will have massive water losses—sorry, water loss in an environmental sense—but it means that what pops out of the couple of tiny creeks at the end of it that go into the Darling is not a lot of water. Most of it gets left in the valley and is used in the landscape.

The Hon. BEN FRANKLIN: I have a final question on the specific connectivity issue between the Macquarie and the Barwon-Darling systems. There have been some concerns raised about erosion banks on private land in the Macquarie Marshes and the impact of those erosion banks on the connectivity between those two river systems. Do you have any comments on that?

Ms MILLER: I do not have any specific comments. I would have to have a look the actual cases to consider that.

Ms FREAK: I would have to look at the cases myself as well.

The Hon. BEN FRANKLIN: If you wanted to take that on notice to provide any comments, that would be helpful.

Ms MILLER: Yes, we can take that on notice. We will talk to our member from Macquarie River Food and Fibre.

The Hon. BEN FRANKLIN: Thank you.

The Hon. PENNY SHARPE: Your submission essentially makes the case for storages being ultimately the simplest way that we can get greatest security across water licences. Does the NSW Irrigators' Council have a view about some of the other things that we can do around efficiency and water recycling in towns? Is that something that you have formed a view on, and do you want to share that with the Committee?

Ms FREAK: We need to fully explore options like that. It is the responsibility of every water user, both within and outside of agriculture, to use water most efficiently. Looking at new technology and new options about what we can do to do that is incredibly important. Those options need to be fully investigated, especially those around managed aquifer recharge, for example. I know that the CSIRO has been doing a bit of work on it, but we need to investigate if that is an option for New South Wales, examine the environmental impacts and benefits and outline the costs. If we can start looking at some of these new, more high-tech options, there is the potential for Australia to be a leader in a lot of this water recycling technology and water conservation efforts. In many ways, it is a big opportunity for us to take a look and where we are now and where we want to be with water security, and look at options such as those to try to get the best water security for everyone.

The Hon. PENNY SHARPE: The problem that we have is a lot of those are at the early innovation stage. The challenge is with the Government looking to spend billions of dollars on essentially old technology via dams versus the new technology. Where is the investment in some of those newer options?

Ms MILLER: Can I just clarify: Are you asking about these as options as a water supply for, say, running a river and agriculture, or as alternative water supplies for urban environments?

The Hon. PENNY SHARPE: Both. There is only as much water as there is water. There is no new water. We cannot magically make water. Essentially we have competing requirements—all of them legitimate—and we try to have a system that tries to allocate that, and you endorse the allocation of where it is. My concern is whether storage the only issue, given that it gets all the attention and the vast bulk of the money? What we are trying to understand is whether that is the best way to do it. From your point of view, is storage really the quickest, easiest and most secure way that you are going to get greater security for irrigators? Do you have faith that there are other options that can come on board, but perhaps we are not there yet.

Ms MILLER: When it comes to recycling, irrigators already recycle their water. They have tailwater dams that capture water. So any water when they irrigate a field—they obviously have very heavy water soil moisture, and they have tail dams at the ends of the fields that catch any water so that it can be recycled and reused. They are already doing that, and that is a really important source of water to get the most of what is available. If you lived in an agricultural area that is close to a large—sorry, if you look at recycling industrial and urban water as an alternative agricultural source, that is certainly an option, and it already happens in many places in regional areas. But when it comes to the volumes involved, because the towns and industry involved are relatively small—

The Hon. PENNY SHARPE: To be clear: When I talk about the recycling project, I do think that for a town water supply, that is where you will get that and that is where you can put the projects in. I am interested in this because your submission is so much about storage being the way forward, so I am trying to explore what else you think is worth looking at.

Ms MILLER: Again, these are fit-for-purpose, fit-for-region solutions. There has been quite a lot of work that has been done on using basic cleaned up sewerage system water so that it is fit for purpose and can be reused for agriculture and gardens, and so forth. You are up against public perceptions about the standard of that water, so there is quite a challenge there. It is actually also very expensive water. So there is a question about if you wanted to put the money into those kinds of recycling capacity. For instance, in Melbourne you could take the water from the south-east treatment plant, which is basically all from the south-eastern Melbourne sewage system.

A lot of water is generated from that and can be cleaned to a high standard, but to get it out to where the irrigated areas are—and they are not that far away—you need to build massive infrastructure. And the costs incurred from that plus the cost of treating the water gets beyond what the farmers can make in return for using it. Again, there are no easy answers here—everything needs to be on the table. We are focused on storage in this particular submission because this is an inquiry about several particular projects.

The CHAIR: The cost for water storage at Wyangala is also an expensive option, and quite a few submissions detailed that expense. It could be $650 million—or as it was last reported, it might be $1.5 billion—and that will be a user-pays principle under the National Water Initiative. That would be something like $31 million per gigalitre if it is 21 gigalitres. Is that not quite expensive, too, compared to water recycling? Water storage options are expensive under a user-pays system.

Ms FREAK: Yes, while the National Water Initiative does have a user-pays principle, in New South Wales under the IPART determinations we actually have an impactor-pays principle, and under that principle it is water users—predominantly irrigators—who pay the costs for these projects. For capital expenditure, water users pay 80 per cent of the costs and for the operational expenditure it is 100 per cent of the cost. Through the IPART pricing determination process, which is ongoing at the moment, we actually dispute that because we feel

that it should be aligned with the National Water Initiative, which has user-pays. That is a more fair way of finding a way to share the costs of this across all of the beneficiaries because it extends well beyond irrigated agriculture, and it also means that we can fully explore options that might be beyond the ability for the irrigated agriculture sector to pay for. It is a really important question around the costs of these particular projects, and that is why—in addition to the water security component—it is the cost that this actually imposes on industry to be providing water security for all other water users as well.

Ms MILLER: You have also got to take into account the cost of not doing it. If you share the costs among all of the beneficiaries, so that is towns, stock and domestic properties, the environment, irrigators and industry, the public benefits of maintaining regional economies, jobs, population, services and so forth should also be taken into account when you are weighing up the cost benefits. It is not just the cost-per-megalitre of water alone.

Ms FREAK: An example of that is through the most recent drought. In the first year of the severe part of that drought, the water in storage allowed the impacts of the drought to be offset because farming could continue with that stored water, but in the following year once that stored water had run out what we saw was slightly over a $1 billion reduction in irrigated agricultural production across Australia. I think that needs to be considered in terms of the cost and benefits as well.

The Hon. MARK BUTTIGIEG: I suppose you could make an analogy with renewables where you have a parameter called global warming and there is a view that we should go to renewables. Eventually the cost-benefit trade-off becomes a tipping point where renewables become more cost-effective and essential to stop global warming. Are we not in effect saying that because we have got an overall diminishing aggregate supply of water over the long term that we must find more efficient technologies to save water rather than building storage because there is no point building storage if the average rainfall is dropping over a long period? Are we at a point where the writings on the wall and we have to look at investing more in water-saving technology and recycling all of the rest as opposed to—I do not want to use the word as it is a pejorative, but it is the only thing that comes to mind—a lazy old infrastructure approach where we do the same thing we have been doing for the last 100 years?

Ms FREAK: I think they go hand in hand in many ways. I think it involves both—that is probably the simple answer. As the Hon. Penny Sharpe was saying earlier, a lot of those more innovative options are in the early stages and they require more research and more development, unfortunately, and we probably need to start acting now alongside doing more research into a lot of those options. I think efficiency is something that has to happen across the board. It has to happen in the way that we store water, so that we can store it most efficiently, and in how we deliver water. Delivery losses in a number of systems are very high because these are rivers, they are not pipes or channels. It is a living system and if you are looking at getting water from A to B through a river which has a number of really important ecological sites along the way and also significant losses, that is not the most efficient way to get water from A to B.

Then, also, we need to look at efficiencies in the consumption end from agriculture but also towns and communities. There are efficiency gains to be made everywhere and it is about investing in those options but also making sure we have got the storage to do that.

Ms MILLER: Another thing, too, is that we have not built any significant storages at all across Australia—the big ones like Hume Dam and city storages—for about the last 40 years. In that 40 years we have seen climate change take off. To take irrigated agriculture as an example, what they could see was that there were no more storages going to be built—they are pretty much where they make sense to build them at this point—and they have spent that 40 years getting super-duper water efficient. We have visions in our heads from maybe 40 years ago or 20 years ago when there was plenty of water, there was not full water-use uptake and it was a wetter time so the stuff was splashed about.

If you go to any of those irrigation areas now, you will find that they already have high-tech water efficiency systems, like the classic example of drip systems—even flood irrigation for pasture and rice is now tightly controlled and automated. There are soil and moisture systems so farmers can sit in their lounge room and it will tell them the point at which a plant is stressed and to water it, and that can save two or three or more waterings in a season, which is a massive water saving. The technologies are already there and they are being used. The farmers are way on top of it and I think that eventually efficiency gains become a diminishing return. We are getting to a point with climate change where we are having to go back and say, "Okay, maybe we need to look at storage again or is there a way of enhancing the storage we already have, as opposed to building new storages in places that might not make sense."

The Hon. MARK BUTTIGIEG: Ms Miller, you raised a point about how there were more intense periods of wetness and therefore we needed to capture that in order to see us through the drought. But if we accept

a priori that there is this long-term trend where we are going to have less rainfall, then, in general, does that imply that rather than raising dam walls—I am not talking about specific projects—we are better off decentralising storage? If you have got less rainfall over a long period, rather than trying to capture it all in one spot, presumably the more you spread it out, the more you are going to capture.

Ms MILLER: And that is what I was referring to earlier. Storage is not just building a whopping great dam somewhere in a headwater. There are multiple types of storage that you can look at.

The Hon. MARK BUTTIGIEG: Which is the off-river stuff you were talking about.

Ms MILLER: Again, you need all options on the table because what might make sense, for example, for the Wyangala Dam and the particular situation of that valley, would not necessarily be the right option in another valley or another part of the valley or on the coast. It is very much about having an open mind and all options on the table.

The CHAIR: Is it correct to say that groundwater is an important part of the water supply for irrigation as well? We have heard that in the Lachlan, 30 to 45 per cent of water sourced for irrigation is groundwater. Is there a particular impact on groundwater and aquifer recharge from some of these big dams or from raising the Wyangala dam wall? Is that a concern that the NSW Irrigators' Council holds?

Ms FREAK: I think it would have to be included in the environmental impact statement for any of the projects to assess things like that properly. From the perspective of irrigated agriculture, groundwater is often used in areas where it is available to offset where surface water is not available. Often in the first year of a drought you will see groundwater usage increase because your surface water allocations will decrease. That is a general rule in the areas that it is available.

Ms MILLER: Groundwater is so complex and it is very much still an evolving science because you cannot see it. It would be hard to comment in any particular case whether raising a dam wall in one particular area and capturing more water, what effect would that have on aquifers downstream. That would depend very much on the depth of the aquifer, the geology of the aquifer, whether it is directly recharged from the river or in fact is a pathway of water that comes from somewhere else. It would be hard, without studies being done—and I would trust that is going to be done as part of the investigations and business case—to know whether or not there could be any indirect impacts on groundwater in the valley.

The CHAIR: Okay. Just one final question in terms of the overall suggestion that bigger dams or the ability to store more water will droughtproof things, if you like, or prevent towns from running out of water; just the example of the expansion of Chaffey Dam in 2016 where it went from 62 gigalitres of storage to 100 gigalitres of storage. I understand that that was nearly full at the start of 2018 but reached and is now 13.5 per cent in January this year. So we see quite a few storages, big dams, that were full and within a couple of years they were close to empty. We heard from Professor Richard Kingsford earlier who said largely because of the allocation of that water, the way in which it is allocated—again with about 2 per cent going to town water supplies—that was the reason, really, that those dams were empty and that those towns ran out of water. Is it not the case of the way in which water is allocated in those dams to begin with? Why would bigger dams and more water being stored change that scenario?

Ms MILLER: Again, taking Wyangala as an example, you are not trying to store more water so that people can use more water. You are trying to store more water so that you can eke it out longer during those dry periods. This is often one of the conundrums with dams. Are you managing it for water storage or are you managing it for flood mitigation? Do you keep it full every single year and not let any of it out for any other purpose other than the stock and domestic and the river run and the towns, so you do not allocate it out to irrigation because perhaps next year might be a worst drought on record, but then you are foreclosing on a pretty important economic activity—quite literally the supply of food and fibre. You would see then if you reduce production price increases in food and fibre. So this is always a balancing act in all of this. So increasing the volume of storage can give you more water to eke out over a longer period. It does not change—it does not mean more water will be used.

As I say, that needs to be weighed up against if you do not allocated or reduce allocations dramatically then you will have an impact on regional economies, on the supply of food and fibre, jobs, services—all things that we want to see in our regions and that we are told constantly are very important to the Australian economy. It is not an easy answer, I guess. I cannot give you a black-and-white answer there but it is a trade-off, is it not? You need to have all of the information available and make those decisions.

Ms FREAK: The other thing I will add for those particular years as well is that it is such a big part of the reason why those dams became so empty: It was because there simply were not the inflows. If we look slightly further up from Chaffey at towns like Armidale, which are at the very top of the Great Dividing Range, there is

not any irrigated agriculture, really, in that particular area and storages for those towns still got critically low to the point that they were on level 5 emergency water restrictions for those towns as well. I guess that shows us that there are towns there that, apart from any system of water allocations and that is in the coastal catchment, for example, it is that there was a water security problem for those towns, irrespective of what water was made available for agriculture.

Ms MILLER: And also on drought. Droughts do not happen like a snap of the fingers. They are usually a slow burn. They start to emerge over, usually, a couple of years and that is why we have the hierarchy that we have with water allocations. As the inflows—and inflows are absolutely critical here—start to drop off you will see that precautionary principle—I am sorry, wrong term—you will see that hierarchy starting to kick in. So they will start to reduce the allocations for irrigations—that is the first one that has the tap turned off—and then they will progressively move up that hierarchy to deal with that. But, as Ms Freak says, primarily it just stopped raining.

The CHAIR: Thank you. I am aware that we are now four minutes over time leading into the next session. Thank you very much for appearing today. We could go on with that issue for some time. I understand you have taken some questions on notice. The secretariat will be in contact in relation to those questions and there may be some supplementary questions as well. Thank you very much.

Ms FREAK: Thank you.

Ms MILLER: Thank you very much.

(The witnesses withdrew.)

GREG MASHIAH, Manager, Water Cycle, Clarence Valley Council, before the Committee via videoconference, sworn and examined

The CHAIR: I welcome our next witness, Mr Greg Mashiah. All the Committee members are in the Jubilee Room in Parliament House. Thank you very much for joining us via videoconference and apologies if you have experienced any audiovisual issues from watching any of the inquiry so far. Would you like to make a short opening statement for the Committee?

Mr MASHIAH: Yes. Thank you for the opportunity to make an opening statement. The Clarence River has the largest coastal catchment in New South Wales. It is just over 22,000 square kilometres. For many decades some communities west of the Great Dividing Range claimed that the water from the Clarence catchment flowing out to sea, particularly during flood time, is wasted and could be used more beneficially by diverting it to the inland regions. One example at the moment is option 8 in the draft *Border Rivers Regional Strategy* which DPIE Water currently has on public exhibition. Option 8 proposes inland diversions from the east. Option 8 mentions the Bradfield and Coffey schemes, which historically have proposed diversions from the Clarence.

One of the projects being considered by this inquiry, the Mole River Dam, has been specifically linked to diversion of the Clarence. Proposals to divert the Clarence to inland regions do not consider the economic, environmental and social impacts to the Clarence catchment. Diversion would have a particularly significant impact on the Clarence fishing industry which consists of over 120 commercial fisherman. The Clarence is one of the most productive fish resources in Australia and regularly reports catches exceeding 1.2 million kilograms per annum. Fisheries research indicates that both estuarine and harvest grounds and the ocean and offshore harvesting sites are heavily reliant on natural river system flow. Likewise the Clarence cane industry is also heavily reliant on floods providing nutrients.

Diversion would also threaten the habitat of the iconic eastern freshwater cod , which is also known as the Clarence River cod. The Clarence River cod is an endangered species. Its recovery plan, which was prepared in accordance with the threatened species provisions of the New South Wales Fisheries Management Act, identified flow regulation and water extraction as specific threatening processes. The Clarence community has repeatedly raised concerns regarding diversion proposals such as the NOT A DROP: Keep The Clarence Mighty campaign. During the recent drought in October 2019 the Clarence River actually stopped flowing, which is the first time that it happened in over 100 years. The Clarence Valley Council has considered the issue of diversion on several occasions but has consistently resolved to oppose any diversion of water from the Clarence catchment due to the economic, environmental and social impacts that such a proposal would have.

The CHAIR: Thank you very much, Mr Mashiah. That is very clear. Thank you very much for your submission to this inquiry. I am just trying to think of the geography of the Mole River and the potential location of the proposed Mole River dam. You are saying that that will specifically impact on the Clarence River. Could you explain how significantly that would impact the river? Has there been any consultation with the Clarence Valley Council in relation to that? Do you have any further information about it?

Mr MASHIAH: The Mole River dam is within its own catchment, which is outside of Clarence. In the past, with some of the historic discussions about dams on the Mole River, it has been suggested that that would be an ideal site for water to be diverted from the Clarence because it is only about 30 kilometres outside Clarence, so one of the reasons we are particularly concerned about the Mole River dam project is because it would make diversion much easier in the future. There has been no specific consultation, but as I mentioned earlier the border rivers draft regional strategy, which is currently on exhibition, does talk about possible diversion. If there is a dam just outside of the catchment that is serving the Murray Darling and border rivers area, and a potential option in the border rivers draft regional strategy that is proposing diversion, we have linked the two as certainly a possibility at some stage in the future.

The CHAIR: Yes, I see. So, diversion by a pipeline or what have you from the Clarence to—

Mr MASHIAH: Yes.

The CHAIR: Okay, got you. I have a question in relation to your opening statement. You mentioned that this last drought saw the Clarence go dry for the first time. What were the specific reasons for that running dry? Was it activities upstream or was it solely due to reduced rainfall and drought?

Mr MASHIAH: We believe it is due to reduced rainfall and drought. We have had a look at some of the longer term rainfall records and on the lower part of the river it was certainly the driest period since 1915, but looking at the rainfall records in some of the upper catchments—and there is not too many rainfall records that go

back over 100 years—but it was certainly the driest period on record in the records that we have going back pre-1915. The 1915 drought was the last time the Clarence had stopped running.

The CHAIR: Has your council looked at any other impacts in relation to the potential Mole River dam or is the diversion from the Clarence your key concern?

Mr MASHIAH: The key concern is diversion from the Clarence. The Mole River project is one that has been flagged in the past but we noted that the terms of reference of the Committee includes consideration of other options ensuring water security in inland regions. There are several historic schemes which have suggested diversion from other parts, such as the two that are mentioned in the draft border rivers regional strategy, the Bradfield scheme and the Coffey Scheme. One of those was building a large dam on the Mann River, which is another tributary of the Clarence, and pumping that over the range. The concern is that other people west of the range see diversion from different parts of the Clarence as being a potential solution to the problems of water security west of the range.

The CHAIR: Yes, for sure.

The Hon. MARK PEARSON: Are there any concerns at all in the Clarence area if the dam was to go ahead, even without water from the river to the Mole River dam? Are there any concerns about what that impact might have in the Clarence area by just the dam being there rather than only taking water from the Clarence River?

Mr MASHIAH: The concerns that have been raised with council by various groups have been related to diversion, so we have not heard any concerns raised about the dam itself. Noting that because the dam is not within our council area, we suspect they would be raised with Tenterfield, which is where I believe the dam is located.

The Hon. MARK PEARSON: And in your statement about the council reiterating its position in relation to this diversion, you say one of the reasons it cannot be justified is a social perspective. Can you elucidate what the council means by social perspective?

Mr MASHIAH: The Clarence community has repeatedly been very much against diversion. There has been quite a significant community campaign called "Not a drop. Keep the Clarence mighty" which has been running for nearly 15 years now. As one example of that, you still see a lot of vehicles in the area with bumper stickers saying "Not a drop. Keep the Clarence mighty", so there does seem to be very widespread community concern about potential diversion not only from the general community but also specific groups. It is one of the few issues where I have seen the canegrowers, the fishermen and environmental groups all in agreement with their opposition.

The Hon. BEN FRANKLIN: Thank you, Mr Mashiah, for being with us virtually. Can I start with if there are any particular pieces of water infrastructure that you would like to see built in the Clarence Valley?

Mr MASHIAH: At this stage, the main piece of infrastructure that is being looked at in the future is actually a council piece of infrastructure. We have a 30,000 megalitre storage dam, so 30 a gigalitre storage dam. It is an off-creek dam and we are in the design of it where the foundations are able to raise it to 75 gigalitres at some stage in the future. That is certainly being looked at as part of the North Coast Regional Water Strategy because at the moment that dam supplies the Clarence Valley and Coffs Harbour and at the moment 30 gigalitres is likely to be sufficient up to about 2046 based on our current consumption.

I would say that would be the main piece of water infrastructure we would be looking at in the medium to long term, is raising Shannon Creek Dam from its current 30 gigalitres to 75 gigalitres. A concern obviously with that is that if we are not proposing to construct that until probably likely 2040s to mid-2050s depending on what a demand in that period and whether the goalposts move. At the moment, we can raise that dam, but our concern is that if there was future legislation that impinged on our ability to raise the dam, it would be a concern. We did try to futureproof it when we built it in 2008 to 2009 by making foundations sufficient for future raising. That has always been part of our plan.

The Hon. BEN FRANKLIN: Fair enough. Have you been engaging with the Government about those plans?

Mr MASHIAH: Yes. All the local water utilities have been involved with the development of the water strategies for the North Coast in this region. So, ourselves and Coffs Harbour in particular had numerous meetings with the DPIE regarding the regional water strategy that is within our area.

The Hon. BEN FRANKLIN: And do you have any concerns or feedback about how that engagement has been going or are you generally satisfied and think it is done well?

Mr MASHIAH: We believe it is going quite well. We are happy that we have been heard, but we are yet to see the options and the draft strategy which is due to be released early next year. At this stage, we are just in the information phase in terms of they have been getting information from us, so whether we are happy or not will I guess depend on what comes out next year. It is scheduled for release around about February.

The Hon. BEN FRANKLIN: Yes. In terms of the perspective, I obviously hear your comments and the comments of council about diverting the Clarence, but could you just give me any thoughts you have more broadly on what we need to do as a State and as a Committee to ensure that into the future, particularly noting the impacts and effects of climate change, we manage our water to allow for the provision of the critical need for town water supply along with the environment and an agriculture and irrigation sector that also needs it.

Mr MASHIAH : Talking with my colleagues who are west of the divide, I think a key challenge is transmission loss, in that we probably lose almost as much water supplying certain towns as they actually generate. So, first of all, it is important that in places where water is flowing along open channels and being lost through evaporation we significantly reduce water losses by piping. We are fortunate on the coast in that our entire system from our dam is piped from the Shannon Creek Dam storage. But if it was flowing along several hundred kilometres of river before it got to us there would be significant transmission losses. The other thing that is important is that there be a diversity of sources. That is one of the things we have been talking about in terms of our draft North Coast water strategy. At the moment we are relying on dams and run of the river supplies, but in the past other options have been looked at, such as desalination.

On the coast we are fortunate, being close to the sea, that desalination is an option. When that was first looked at, going back 20 to 25 years ago when we were doing the planning for Shannon Creek Dam, the technology was not as feasible as it is now. It is important that there be a range or suite of options that you look at in terms of your storages and that you try to minimise your transmission losses. The other side that is important is that you consider water efficiency because as a society we still tend to waste a lot of water. In terms of town water supplies west of the range, one of the largest demands is evaporative cooling, so there is a significant difference in the per capita consumption west of the range compared to east the range due to the large-scale use of evaporative cooling. Potentially, water efficiencies could be gained west of the range in terms of town water supplies by having people use air conditioning rather than evaporative cooling.

The Hon. BEN FRANKLIN: Yes. I could not agree with you more that there is no silver bullet and we have to focus on issues of both supply and demand in order to get this right. The final question I have is one that I asked previously today. At our first hearing we heard from the Inland Rivers Network, who said that with the recent rainfall the need to build water infrastructure has abated and, because it has rained, now is not the time to do it. Do you agree with that comment? Do you have any views on that?

Mr MASHIAH : If I could draw from that one of our experiences only two years ago here on the Clarence. In December 2018, a week before Christmas, the Nymboida River experienced a 1 per cent flood—a flood with a probability of 1 per cent each year, often known as a one in 100 year flood—which was one of the largest floods we had experienced there. The river then recorded its lowest ever flow in November 2019 and, sadly, as some of the Committee may be aware, the fire went through the village and destroyed about 45 houses. I know some of the residents out there who had been flooded 12 months previously with the largest flood on record, then having the river running basically at its lowest ever flow.

The fact that it rains at one point can mean that within 12 months it is very dry. Even though the Clarence had a minor flood in February this year, at the moment the rivers are again flowing at what is called the 95 per cent level, which is the lowest 5 per cent of the flow and still dropping. So, the flows today are very close to the flows in about October last year in the middle of the drought, notwithstanding that we had a very wet February and March.

The Hon. BEN FRANKLIN: So it sounds like you would fundamentally disagree with their statement?

Mr MASHIAH : Yes. In summary, the fact that it rained earlier in the year probably means that because it was very dry due to the drought, the soil moisture has gone right down from what I can see from the Bureau of Meteorology reports in this area at least. A lot of farmers in this area particularly, which mainly has cattle and cane, are starting to increase their water use. We see it from water carting—people who have rainwater tanks having increased water carting. Water carting from rainwater tanks and domestic water use has gone up significantly in the past couple of months while we wait for the promised La Niña rainfall.

The Hon. BEN FRANKLIN: Well, we are all waiting for that.

The CHAIR: I understand we are at the end of questions from Committee members. Thank you very much for appearing via teleconference today, Mr Mashiah, and for your submission and contribution to this inquiry.

(The witness withdrew.)

(Luncheon adjournment)

ROSS McDONNELL, Executive Member, National Parks Association of NSW, affirmed and examined

GARY DUNNETT, Executive Officer, National Parks Association of NSW, affirmed and examined

CHRIS GAMBIAN, CEO, Nature Conservation Council of NSW, sworn and examined

JACQUI MUMFORD, Organising Director, Nature Conservation Council of NSW, sworn and examined

The CHAIR: I welcome our next witnesses from the National Parks Association of NSW and the Nature Conservation Council of NSW. Before we kick off I thank the tech team, who has fixed the microphones and the audio during the luncheon adjournment. The sound is now much better than it was in our earlier session. Would any of the witnesses care to make a short opening statement?

Mr McDONNELL: Thank you for the opportunity to speak with you today. Mr Dunnett and I are here representing the National Parks Association of NSW [NPA], which was established in 1957. It has 4,000 members, 20,000 supporters and 15 branches, and its vision is to protect nature. One of the ways that is achieved in this State is by the establishment and management of the national park system—the protected area system. Some of the catchments that have strategies developed for them have reserves in them. Many of those reserves are in the upper portions of the catchments but, importantly for the NPA, there are reserves that are in the lower portions of the catchments that are in water dependent ecosystems, which are very reliant on flows through the catchments, so the NPA is interested in the issues that are in front of you.

There are a variety of water dependent ecosystems that occur in all of the catchments in New South Wales. The ones that relate to this inquiry would be the Gwydir Wetlands State Conservation Area, Macquarie Marshes, Booligal Wetlands, there is a whole raft of them but further west there is Paroo-Darling, Taroo, Thyra and [*inaudible*]. Some of the reserves are recognised nationally and internationally as being significant and some are RAMSAR wetlands which is an international convention for wetlands of which Australia is a signatory. So there are recognised conservation values in those reserves and in the surrounding landscapes because the NPA recognises while we are interested in National Parks, National Parks sit within a landscape and many of the wetland dependent reserves sit in wetlands, of which the reserves are only a part of the wetlands. So in considering catchment issues and considering wetland issues there is a need to look across tenure and consider what those impacts might be.

NPA believes a multipronged approach can be applied when looking at the equitable use of water in the catchments. Some of those elements include the legislative framework. There are a couple of pieces of legislation that I would draw your attention to. There is the NSW Water Management Act, where the principles are to be consistent in that Act with ecologically sustainable development. The objects of the Water Management Act refer to protect, enhance and restore water resources, their associated ecosystems, ecological processes, biological diversity and water quality.

Another piece of legislation is the National Parks and Wildlife Act, which indicates that it is a statutory obligation of the State to deliver water, to maintain ecological processes and water dependent sites. So the State has a mandate to act for the environment and for environmental outcomes in regard to how water resources are used in the State. Some other options that apply are the operating procedures. In a broad, overarching perspective there is the Murray-Darling Basin Plan and the sustainable diversion limits, which ideally are applied in each catchment. There are water sharing plans. Ideally they should cover all uses and all users of water in an equitable way. Constraints management. There are concerns about the number both of procedural constraints and physical constraints to the movement of water across catchments and different users in an equitable way.

Finally there are engineering solutions, which the strategies that the NPA has reviewed and which have been on public exhibition seem to be what the priority within those strategies appear to be that ever increasing reliance on engineering solutions to resolve equity problems. So the NPA is not arguing that there should be a return to pre-regulation. It has recognised that communities and industries all rely on an existing set of infrastructure. Towns need water, existing irrigation areas need water, landholders need stock and domestic, which is sometimes supplied by pipelines. That is understood. The question is how much infrastructure is enough and how much is too much—and what are the detrimental outcomes of incrementally increasing the amount of reliance on infrastructure.

In reviewing the draft strategies that have been available, the NPA is of the view that the strategies have had some useful aspects to them. They have outlined the historical use of water reasonably well, environmental assets risks values—fine. They identified further studies which are fine. We know that comments around needing more groundwater studies seems to be an ongoing comment without their actually being very much in the way of groundwater studies occurring. It was good to see climate change predictions being included in the considerations.

However the strategies uniformly appear to fall down on the basis that they did not really assess current conditions of surface and groundwater and therefore did not really acknowledge what we believe to be the current over utilisation and allocation of water.

The NPA has put forward a written submission to the inquiry. They have identified from those strategies, looking at the options, we have identified a whole raft of options which we believe to be of good value. We have also identified various options we believe are not of great value. Specifically, the large infrastructure items such as new dams, additions to the extent of current dams and regulators and weirs. So the NPA position is that the business as usual model is probably not the right way forward—business as usual meaning to continue to incorporate ever increasing amounts of infrastructure. We believe that the inquiry is an opportunity to dispel the myth that exists which is that more dams mean more and better water reliability. Continuing to add infrastructure, we believe, does not aid the systems particularly from the point of view of what our interests are and that is the water dependent ecosystems.

One of the bright stories in the past decade has been about environmental flows. The ability of both the State and Commonwealth to acquire water and then provide environmental flows to water dependent ecosystems is a good news story. If you look at the Commonwealth environmental website, you will see for each catchment the history in the last decade of environmental water provision to water dependent ecosystems. There is a correlation—and bringing these things to a head—that if you build more storage systems on rivers or off river storage, the tendency then will be to draw more of the flows that are in the river systems into the storage because you have got more storage capability. A linkage here is that many of the environmental flows—

The CHAIR: Just quickly, Mr McDonnell. This is your final closing statement, isn't it?

Mr McDONNELL: It is, yes. Many of the environmental flows that occur in New South Wales piggyback on the back of natural flows that are in systems. If increasingly those natural flows are taken out of the system and put into storage it compromises the ability of government agencies to provide environmental flows to water dependent ecosystems.

The CHAIR: Great. Sorry to close you off there but I realised we are closing in on question time. I will now go to the Nature Conservation Council.

Mr GAMBIAN: Thank you for the opportunity to share some thoughts on this very important issue. A few weeks ago a Aboriginal Elder in Bourke told me a story about the pipeline that now runs from the Murray River to Broken Hill—that is the pipeline that ensures the reliable water supply to Broken Hill. He told me how the news in the area could smell the water in the pipe and came looking for it. But I could not access the water and it was the worst drought on record so along the length of the pipeline you can find the remains of emus that died in that desperate search for water. I am telling you this because the interventions we make—even with the best of intentions—can have dire consequences. When it comes to water some of our proposed interventions will have massive consequences without necessarily the guiding light of good intentions.

I want to acknowledge the country we meet on today and pay my respects to the Gadigal people as the First People and custodians of this country. I also want to pay my respects to the Barkindji people whose country includes the Barker River and the Menindee Lakes. Three weeks ago my colleague, Jacqui Mumford, and I travelled from Sydney to Brewarrina and then along the Barwon-Darling-Barker through to Menindee. We met locals at Bourke and Wilcannia, we met farmers and irrigators at Tilpa and we met a group of Barkindji leaders in Menindee. Everywhere we went and everyone we spoke to had a very similar message. The river is the life of the region. When the river runs dry so does the community. When the river flourishes, life comes back.

The problem is also reasonably clear. There are just too many straws in the glass. No amount of expenditure on water infrastructure solves that most fundamental of issues. How do we, in the driest continent on earth, live within our means when it comes to water? I do not want you to misunderstand my meaning here. Agriculture is an essential activity in the Murray-Darling Basin; irrigation is essential to that agriculture. We have no argument against any particular crop. We accept that towns need reliable water. All of that is true. It is also true that without sufficient flow the river dies. Indeed, it ceases to be a river and becomes nothing more than an industrial irrigation channel and not a very good one at that. In a moment, Jackie will describe the biodiversity that is at stake here. When we went to Menindee Lakes, it was absolutely bone dry. That is despite the heavy rains that fell in March this year. The Menindee water-saving project will kill Lake Menindee. Nobody I spoke to wants that—not farmers, not fishermen, not the Barkindji, not the community. No-one I spoke to wants the water-saving project.

The Menindee water-saving project simply means more water can be extracted from the top of the river system. The area around Menindee is of vital interest to the local community, including the Barkindji native title holders, for whom there are literally thousands of special sites that are being damaged because of a lack of water

in the lakes and for the whom the river and lakes are essential to their cultural life. For people in Broken Hill, the lakes are an important place for recreation, including recreational fishermen. The lack of regulation of floodplain harvesting; the lack of reliable metering systems, particularly in the northern basin; the failure to properly forecast the water that will ever be available in the system after climate change as well as the overall allocation and over-extraction of water in the system are all critical problems that need to be solved. Menindee Lakes should be Ramsar listed, but instead the water-saving project will kill them.

Ms MUMFORD: I want to draw on the work of one of my university professors, Richard Kingsford, to highlight some of the impacts that Chris mentioned on biodiversity. Over the long term, nearly half of the average annual river flow at Menindee is taken out upstream mainly for irrigation. The Darling River is now experiencing river droughts much more severe and prolonged than it has historically. The river stops flowing more often and for longer than it used to, which is driving more blue-green algal blooms and other river degradation. The science on it is unequivocal. In the long run, substantial reductions in water are not good for fish or waterbirds nor for any other river plants or animals. There is little apart from widespread flooding in the Darling River catchment that will alleviate this current crisis, with experts predicting more fish kills to come.

Water bird numbers at the world-famous Menindee Lakes are in long-term decline due to ongoing failure to manage water levels. Bird numbers at the lakes in far Western New South Wales peaked at about 140,000 in 1985, according to surveys taken annually since 1983. For each good wet year since that record, the bird count has been falling. As Chris mentioned, we visited the Darling River and Menindee Lakes just a couple of weeks ago. Being there was a really powerful experience. As we drove into Lake Pamamaroo in the Menindee system, I spotted a mallee ringneck parrot and made Chris stop the car because I was so struck by the teal-and-yellow markings on it. The nature that we have along the Darling Barka is world-class, but we are taking away the life force that underpins it.

The CHAIR: We have had a couple of witnesses this morning acknowledge that—in fact, the NSW Irrigators' Council just this morning acknowledged that they are taking climate change into account in terms of looking at water availability into the future but said that is actually why we need these dams. We need to raise Wyangala dam wall. We need other mass water storage projects because of decreased water availability into the future. It will therefore mean greater water security. Would either of your organisations care to comment on that assertion?

Mr GAMBIAN: We have heard that line of argument as well. I think the problem with that argument is that, when it comes to actually establishing the allocations, we are not looking at most contemporary data, which in itself then causes a problem because we basically keep making promises that cannot be kept. Yes, climate change is going to change the equation. Evaporation is going to continue to be a problem, no matter how much storage you have. Dam walls will not make it actually rain. Yes, there is this sort of logic of long-term storage and all of that, but then you simultaneously say that we are going to reengineer Menindee Lakes system to remove Menindee Lake as a storage effectively. I think there is lack of faith in this stuff when you go, "Well, are we able to live within our means? If we project out into the future, is it realistic to fulfil some of these licenses?" I think the answer to that is no. You are not going to be able to build a big enough dam to give us the sort of water levels that were available 100 years ago.

Mr DUNNETT: I guess the concern we would like to express is that we all understand that those water-dependent systems are naturally highly variable and that there have been many larger droughts than we have experienced in the last century in the history of this continent, but we are extraordinarily at risk of the shifting-baseline phenomena of not actually recognising the long-term declines that are happening as we take more and more water out of the system and concentrate more and more water. While there is great resilience to those systems to drying out, when that starts to happen at the scale of decades-long periods and ultimately hundreds of years, those critical environmental assets are not going to be there in another century. We will not necessarily see it immediately after those dams come through. But we will see it in the following decades.

The CHAIR: Have any of your organisations done any work or are you aware of anything in terms of alternatives to these dams? What could communities, water utilities or WaterNSW be looking at to ensure water security in these areas? At the moment we have, for example, Wyangala Dam, which the Committee has spent quite a bit of time on to date. We are looking at Menindee in the new year as well. But that has been put forward as the option for water security in the Lachlan. Meanwhile, there have been other options that have been explored by various water utilities. Would anyone care to comment on what those should be?

Mr McDONNELL: There are opportunities for water-saving measures that can apply in relation to irrigation areas: the changing of crops potentially, the way water is utilised within irrigation areas, drip systems. Mechanisms exist which can allow the same output of agricultural production but with less water. Some of those mechanisms are being put into place now because of the stresses that some irrigation systems are under. You

should not necessarily think that there is no option for agricultural production other than to use large storage facilities. Around the world, crops are grown in some incredibly dry locations—drier than some of these catchments are in New South Wales—yet they are able to produce crops. A degree of innovation is required from agricultural producers. The expectation is that that might happen over time, but I suggest that they will not do that if the availability of water is continued in the way that is has been or is expanded upon by more dams.

Mr GAMBIAN: I think there are two issues here. Pardon the terrible pun, but there needs to be a level playing field when comes to floodplain harvesting. Private interests are taking out or stopping huge amounts of water from entering the system in the first place. Other people are then experiencing a shortage, so that is a sort of self-fulfilling prophecy in some ways. If you have allowed too much extraction, then we are just going to keep having this problem. We need a fairer system that recognises that there are a lot of different uses for water and lots of different people need water for a lot of different reasons, but there is a finite amount of it.

We have got to share that around and balance the resource in a much more sophisticated way. You cannot keep sucking out of the top. You do not need to expand dams and all of that kind of stuff—with all of the consequences, then, of those dams—if you are being realistic about how much can be afforded at the top of the Basin. If you are getting that balance right then those dams will be fine.

The Hon. MARK BUTTIGIEG: I would like to follow up on that. We had—let us call it contradictory—evidence from the previous witnesses from the NSW Irrigators' Council when this question of technology was raised. Their view was that we have had a 40-year, 50-year period without any dam infrastructure, and that has driven innovation to the point where the sorts of technological advancements you are talking about have already been developed—the drip feeding and—

The CHAIR: The efficiencies.

The Hon. MARK BUTTIGIEG: The efficiencies and all of that sort of thing. What you are suggesting is that is actually not the case—there is still a lot more we can do in that area. I just want to try to reconcile those two contradictory pieces of evidence. On the one hand they are saying, "Look, we have been struggling for so long that we have squeezed as much blood out of the stone as we can. It is time to build more infrastructure". You are saying, "Well, that is not necessarily the case". I just want to get your views on that.

Mr McDONNELL: I can add a personal view. Up until two years ago I lived in an irrigation district in the Riverina, in Griffith. For 30 years I understood the whole Murray-Darling Basin Plan process that applied there, the concern in the community and the outrage that was highlighted in the media. I was not in irrigation, but I had irrigation friends who ran properties. My personal observation was that they are still transitioning through advances they can make in an agricultural sense. There is no sense that it is finished. The types of options that might be available might have slowed down, but their application in the field still needs to happen in a more complete way.

The Hon. MARK BUTTIGIEG: It is scale that is the issue.

Mr McDONNELL: It is a scale issue there. It is not just the technological advances; it is how well they get adopted and how widespread they are adopted. There are still many older-generation irrigators who are still relying on the older thinking to get by. They are not adopting new technologies. Younger irrigators appear to be more up to speed with using less water and getting more efficiencies.

The Hon. MARK BUTTIGIEG: Is it the case that you need both an increase in the supply side—in other words, assuming that we get rain, that you need storage as well as the technology? Or do you think, with those sorts of scale things that you are talking about, that might be enough to solve the problem?

Mr McDONNELL: There are a couple of things happening. There are efficiency programs that are occurring that are reducing the amount of available water into irrigation areas at the same time as these new technologies are being applied. A win-win situation from an irrigator—and I am not one, or have not been one, but my understanding from talking with them is that if they can use less water then they pay for less water and they have got an ability to make a higher return from the crop they make. It is in their financial interests to adopt new technologies. Sure, that costs a bit of up-front funding, but if you are looking at it longer term there is a return there.

The Hon. CATHERINE CUSACK: I wanted to ask you about the Ramsar-listed areas. We did have evidence this morning from Professor Kingsford, who said that, particularly in relation to the floodplains around the Lachlan River, he felt there were thousands of hectares of land that should be listed but are not listed. I wondered if you had any thoughts on that.

Mr GAMBIAN: Yes, and we certainly defer to Professor Kingsford's expertise in this particular area. One of the areas that we are particularly interested in, as I said in my opening remarks, is that the Menindee Lakes themselves should be Ramsar listed.

The Hon. CATHERINE CUSACK: I am amazed they are not.

Mr GAMBIAN: It would be an extraordinary step forward. They are certainly that valuable. The analogy I think people use—and Ms Mumford went through the variety of biodiversity that is there and should be there in bigger numbers—is that it is the Kakadu of the south. It is certainly a precious region. I think that Ramsar listing for Menindee Lakes would be the kind of—I think there would be a lot of community support for that idea. In fact, I know there is a lot of community support for that idea in the region. I think it would help that region put itself on the map, as it were. I think most people are still not really particularly aware of Menindee Lakes, even here in Sydney. That would be a very big step forward. I think elsewhere in the system there are probably wetlands that are worthy of that kind of consideration. Places that are already Ramsar listed are struggling because of some of the approaches we have taken to water in the last few years.

The Hon. CATHERINE CUSACK: I was actually staying at Kinchega more than 10 years ago when the lakes were in flood. It was amazing. The bird life was—but why are they not listed? What are the hurdles to listing, and is listing going to be beneficial in terms of how the water is managed for the environment? Or is it not really going to make any difference?

Mr GAMBIAN: My understanding is that a fairly detailed proposal was made—I think it was about a decade ago. There was a report written—commissioned, if memory serves me correctly, by Government at the time—to make the case for Menindee Lakes being listed. That work is still available. My understanding is that it requires the Commonwealth and State governments to make the proposal for Ramsar listing. From a conservation perspective, the impact would be fairly minimal. It is more of a moral listing than any sort of practical status within Australian law. But what I think it would do is give those areas the sort of significance that they deserve, and when we go to make a decision about something like the water saving project—Ms Mumford and I visited Pamamaroo. It has got water in it. There is life.

Yes, it is still a bit degraded and could do with more water more often, but Pamamaroo is there. Metres away, Menindee Lake is bone dry. We went for a walk on it. That is because of human intervention. That is not how the water course normally should have worked. That is because of decisions that get taken about how water is managed, and you can get the water further down the system faster if you bypass Menindee Lake. What does that mean? The morning that we got to Bourke, water stopped flowing over the Bourke Weir since the rains in March. It is big news in town when the water stops flowing over the weir. Of course, the consequences are going to be felt right down the system.

If you take Menindee Lakes out of the equation and you can get the water down faster, it just means that you can meet certain requirements further down whilst still taking too much out of the top. Ramsar listing would be an important symbol, but the thing that would need to follow that—hopefully from the attention and the significance of Ramsar listing it might cause us all to think about what we are doing to protect it and how our actions are damaging it in the same way that, say, World Heritage listing of the Blue Mountains or something like that might have changed thinking around those regions.

Mr McDONNELL: In a former life I was a regional manager with NSW National Parks and Wildlife Service in the Riverina-Central West. Some of the reserves I managed are Ramsar listed, and I have been involved in establishing new reserves that should be Ramsar listed—Yanga, for example, near Balranald.

The CHAIR: Absolutely.

Mr McDONNELL: Just a bit of clarity on Ramsar listing: The management planning and the detail that goes into a listing focuses very much on the technical aspects. Regardless of what the tenure is, it will assist the land manager because it is a very technical process that you need to follow. You end up with a very technical document that clearly identifies the values and the risks. That forms a benchmark that you can assess against down the track. In relation to the NSW National Parks and Wildlife Service, their plans of management, for example, do not go into that much detail. So there is a lot more clarity in relation to what the values are and what the risks are, and the processes you need to follow as a land manager to maintain those values is more clearly defined in a Ramsar site than in a non-Ramsar site.

The Hon. CATHERINE CUSACK: I think he was referring to something like 4,000 square hectares of flood plains—it seemed pretty remarkable. The councils that we heard from earlier today were very adamant that they want to see population growth and economic growth in the region. Do you have any comments about the ability of that system to sustain growth, given that the infrastructure spending we are looking at is being done in the name of security of what is there?

Mr GAMBIAN: I do, and this might sound contradictory but I hope it isn't. One of the things that really struck me—we visited three weeks ago but I also went last December. It was a bit of a hard thing to hear when a number of people said to us—and we tried actively to meet with everybody. We did not just meet with the greenies; we tried to meet with as many people as we could. One of the things that kept coming up was this real sense of abandonment and this real sense of fear that there was either an intentional or unintentional desire to depopulate the region. I find "depopulate the region" a really distressing term, when we think about this is Australia, this is New South Wales, and this idea that there are communities along that river that are at the centre of our national identity.

Wilcannia was at one time the fourth biggest port in Australia. This beautiful town, now derelict in many ways, but still is this great town with a lot of life and energy in it. Central Darling council has not had an elected council for several years now. One of the issues we have got is that those communities have really been quite decimated because of drought and because of changes in a whole bunch of different things, including water. And whilst there is this juggle around what do we do with the water, the human consumption of water in this region is not a lot of water overall. There is absolutely the capacity to have towns that are built around tourism, even around farming and agriculture.

As I said in my opening remarks, we do not have an argument with irrigation per se. We do not have an argument with farming at all. We stayed with farmers while we travelled down the river. That is not the problem. The problem is living within our means, and are we trying to put water into things that we just cannot afford and we just cannot sustain? Broken Hill is a fantastic city that could have more people in it. Wilcannia, Brewarrina, Menindee, Pooncarie—all of these towns could have bigger populations. Not tens of thousands or hundreds of thousands of people, but instead of 800 they could have 2,000. We are still not talking about a lot of human consumption of water, but we are talking about really re-energising these towns and giving them a new lease of life.

Something as simple as building the road—sealing the road between Wilcannia and Pooncarie, not a particularly long stretch of road in the scheme of things. We were supposed to stay at Tolarno Station one night. It started raining and then eventually started hailing, which meant that we could not do the 25-minute drive from Menindee to Tolarno, and that is just a fact of life for people in Pooncarie. These are little things but it would make the world of difference to the vibrancy of that whole region. I love the region and it is something that I wish more people could experience.

The Hon. PENNY SHARPE: I wanted to go to the point in the NPA submission, which also flows through in all of these things. It seems to me that part of the difficulty that we have in examining any of these projects is that there is a lot of competing legislation, particularly around environmental protections. You make note that the current projects, in your view, are outside the Water Management Act. I wondered if you wanted to expand a bit on that, because the projects seem to all be coming under different regimes. And, of course, if they are made State significant, which they will be at some point—the fast-tracking process is heading down that path—how much is suspended in terms of being able to seriously look at the environmental protections that really should be in operation, given that they have been defined in about four or five other pieces of legislation?

Mr DUNNETT: One of the really challenging considerations is that we are talking about a series of individual projects, but the scale at which they will have impacts is right across the basin. The one thing that our environmental planning laws does incredibly poorly is to actually factor in the cumulative impacts and deal with things at scale. We have this micro perspective that focuses in on the footprint of the individual dam or piece of infrastructure, and the clarity that comes from that regional strategic focus is almost always missing when you actually look at the environmental impact statements that are prepared. So it is no surprise that again and again both the State and Commonwealth will approve these on environmental grounds because they cannot actually put their hands on their hearts and say, "This is going to be a catastrophic impact."

But the reality is that cumulatively we cannot afford to keep allocating so much of the water from that system into storage systems. We are going to lose the capacity for those water-dependent ecosystems to sustain themselves. That is why something like Ramsar has some genuine benefits, not just, as Mr McDonnell says, in terms of being able to provide the focus management of those individual sites but because it brings the Commonwealth water holder to the table through the basin plan. For what it is worth at the moment, it triggers the EPBC processes, which gives us some semblance of a national and international perspective on this issue. I think more than anything else, we have a fundamental problem with our planning rules in terms of grappling with things beyond the micro scale of the individual footprint.

The Hon. PENNY SHARPE: I wanted to ask you about over-allocation. Everyone uses the term, but it basically means that, as Mr Gambian said, we are unable to live within our means around water, and that means that there have got to be some hard choices about that. Do you want to comment on that? My understanding is

that our groundwater is over allocated, that our river water is over allocated and there does not seem to be any process to manage that. Instead we are looking at different diversions for different management regimes, which leads us to the projects that we have before us. As groups that have grappled with the over-allocation, and you have talked about it a lot, do you want to expand on your views about that, and how do we really get to the nub of this and deal with the over-allocation that is currently there? Those are big questions, I know.

Mr GAMBIAN: It is a brave person who tries to explain water policy, and I am not going to claim to be that person. I think that there are a couple of aspects to this. One is that if your starting point is unrealistic science around how much water there is ever going to be then you are going to end up with a problem where you are licensing more water than anyone is ever going to get. People with water licences that we spoke to acknowledge that the more licences that are created, the more water that is nominally allocated—it is literally making a promise that cannot be fulfilled. We are conferring property rights on people knowing full well that if we had a more realistic sense of how much water there was likely to be in the system, we would not be able to allocate that kind of water. That is one part of the problem.

The other part of the problem is that the rules around extraction are too generous in many cases. Another part of the problem—and, in my view, the most significant part of the problem—is that when it comes to flood plains we are taking a far too laissez-faire approach to water that is pulled out of the system before it even arrives and, certainly with some of the proposals that have been around recently, running the risk of creating property rights for people that are never going to be able to be ultimately sustainable if we are being serious about how much water there is going to be available in the system.

So better metering—a better baseline of science that recognises that for two droughts in a row we have had the worst droughts on record, and that there is no sign that is going to change any time soon. We need to just have a much more realistic view about how much water is ever going to be available.

The Hon. PENNY SHARPE: We have the perverse reality that the data that is used does not take into account the most recent droughts.

Mr GAMBIAN: Yes, that is right, which is extraordinary. I have been told that there is work being done to start recognising climate change and modelling for various climate scenarios—that is being done at the Murray-Darling Basin Authority. We have not seen that work yet, but I will take them at their word that they are trying to work on that. I think that better modelling would probably be a bit of a wake-up call to everybody who has got an interest in the system. At the end of the day, I do not think anybody thinks that it is a good thing that the river does not flow, so if we have some baseline values that we all accept and that we can all agree on, then you work backwards from: How much water is going to be available if one of our goals is to keep the river flowing?

The Hon. CATHERINE CUSACK: Professor Kingsford was saying that the river is managed on the basis of historical data. Would you support modelling that looked at the future to be incorporated into the management decisions?

Mr GAMBIAN: Yes, absolutely.

Mr McDONNELL: There is probably a need, and you may know the difference between having a licence and an allocation. You can have a licence that will have a megalitre number to it—

The Hon. PENNY SHARPE: Notionally, yes.

Mr McDONNELL: —but, what you receive as an irrigator can be quite different to that, and it depends on the circumstances at the time. To my knowledge, most irrigators wait to see that the percentage of their licence is allocated before they go ahead with a commercial decision. You could end up with a perverse outcome where if the water storages are holding more water, there could be a lot of pressure on the water agencies to release more water to those that have got licences.

The CHAIR: We have run out of time.

The Hon. PENNY SHARPE: Thank you for your submissions, they were very good.

The CHAIR: Yes, thank you for your extensive submissions and for presenting to today's inquiry. Thank you so much.

(The witnesses withdrew.)

KATE BOYD, Convenor, Mole River Protection Alliance, before the Committee via teleconference, affirmed and examined

BRUCE NORRIS, Landowner, Mole River Protection Alliance, before the Committee via teleconference, affirmed and examined

MELISSA GRAY, Convenor, Healthy Rivers Dubbo, before the Committee via teleconference, affirmed and examined

The CHAIR: Thank you very much for joining us. Ms Boyd and Mr Norris, would either of you like to make an opening statement on behalf of the Mole River Protection Alliance?

Ms BOYD: Yes, we will do it jointly. Mr Norris will speak first, then I will speak and then Mr Norris will conclude.

Mr NORRIS: The Mole River Dam should be removed from the State's critical infrastructure because it will not meet the needs of any of the localities in schedule 2. The closest locality is Walgett where the weir has been raised this year, meeting that need. The principal purpose of the Mole River Dam appears to be improving irrigation security. Many of the irrigators along the Mole and Dumaresq believe that the dam will make their enterprises less viable. Since we submitted our concerns about the dam, people along the Mole and Dumaresq below the dam site have been increasingly frustrated by WaterNSW's failure to meet with them, discuss options for water management or to provide useful answers to questions. By pressing ahead in this way with a business case for a dam considered uneconomical when these affected people are still in drought and struggling to cope from extreme fires, the Government shows a lack of empathy.

Ms BOYD: The draft regional water strategy for The Border Rivers was recently released but no meeting was held near Tenterfield, Bonshaw or Collarenebri to discuss it—submissions close on Monday. It includes 50 options for changing water management. Most are good options; building this dam is not an option. The general public, particularly people along the Barwon-Darling River and anyone in The Border Rivers, should be involved in deciding what objectives they want to achieve rather than the Government rushing ahead with a business case for the Mole River Dam. This public consideration is a necessary input to any business case.

Will the business case for this dam consider spending money on all of the good options as an alternative to the dam? Precisely what is the $24 million being spent doing? Will scenarios to be trialled for use of the water be discussed with the community? Are environmental impacts downstream on groundwater intake, aquatic ecosystems, wetlands such as Boobera Lagoon or people along the Barwon-Darling being assessed? Impacts within the dam footprint are being assessed, however local Aboriginal people are unhappy about the process of archaeological investigation and the attitude of the archaeologists.

Mr NORRIS: As a directly affected landholder, the rationale for this dam is lost on me. The inability to input our view into the development process is frustrating and emotionally draining. Any of the proposed benefits seem to be negated by the loss likely to be incurred financially by those business in the Mole and Dumaresq river systems. We request that all information gathered and modelling undertaken be publicly released, peer reviewed and discussed with the community as part of that process of developing the business case—unless the whole idea is dropped. Thank you.

The CHAIR: Ms Gray, do you have a short opening statement to provide to the Committee as well?

Ms GRAY: Yeah, thank you. My submission was on all five projects but I would like to focus on the Macquarie re-regulating dam project, which is a project to provide an extra 14,000 megalitres a year to general security irrigation. Now, that is not really very much water from their perspective, but from an environmental perspective it is critical low flows in most dry years. We know the environmental impacts will be significant on threatened species, migratory birds and Ramsar wetlands. We know this from the Commonwealth Environment Protection and Biodiversity Conservation Act referral. We know that a First Nation cultural site will be inundated by this project. We understand the different ways that native fish will fail to breed and will starve within a still water environment that this project would create. We understand how, by twisting definitions in the scoping reports, WaterNSW really is saying that tributary flows that come into the river below Burrendong will indeed be captured by this project and used for general security customers.

The impact on Ramsar-listed marshes and the environment is really well described by the Murray-Darling Basin Authority's submission to this inquiry. But what we do not know is how much more taxpayer money New South Wales is willing to throw at this project before it finally admits that it probably will not be approved. What is in the business case? This is what we want to know. How much over $30 million is this project projected to cost? Has the impact that this project would have on the local recreational fishing economy been assessed? Will

that be assessed in the business case? What about the impact on the unregulated irrigation industry downstream and the grazing industry downstream? This project would mean fewer flows leave the Macquarie and enter the Barwon system so there would be less town water supply say for places like Brewarrina and Bourke. Would the social-economic impact of that be in the business case? What is the social-economic impact to Warren of having the river cut off up at Gin Gin every time there is a drought, which is what the regional water strategy is implying would happen? So, yeah, there are a lot of unknowns in the business case. We really need those answers.

The CHAIR: Thank you very much. We will move to questions. We will begin with questions from the crossbench and then questions from the Government members and then from the Opposition. We will commence with questions by me. Going to the Mole River Protection Alliance, I will let you decide who will answer the question. What impact do you think the Mole River Dam will have on groundwater, particularly within the border rivers system?

Ms BOYD: Thank you for the question. We are having a little difficulty hearing you. Did you say what impact on groundwater systems?

The CHAIR: Yes. Can you hear me okay now?

Ms BOYD: Yes. That is a little better.

The CHAIR: All right.

Ms BOYD: The dam by its nature will trap the higher flows whenever it has been used and partly emptied. Those higher flows are important for the flows along the river itself, for the river ecology, and if they are high enough flooding out. The groundwater is increased at times of high flow and used to flow back into the Dumaresq River at times of low flow. But the groundwater is now being pumped down enough that it is really only a receiving system. The combined impact of the Mole River Dam and Glenlyon Dam means that there tends to be less high flows along be Dumaresq, in particular. The groundwater in that section is going to be reduced. This will impact on the trees that depend on groundwater to some extent as well as on irrigation from the groundwater and on any other groundwater-dependent ecosystems.

The CHAIR: Thank you. You note in your submission—going to the Mole River Protection Alliance for now—that the Mole River Dam is not compatible with the requirement for a further 5.1 gigalitres to be recovered for the border river system to meet its sustainable diversion limit. Could either of you please expand on that for the Committee?

Ms BOYD: The dam has been designed with a use of the water in mind—the use of the water for extractive purposes. By using that water it means that the water that gets taken out is not being allocated to the environment. If the water requirements under the Murray-Darling Basin Plan were to be met by looking after the environment properly in providing water then there would be a reduction rather than an increase in the amount of water diverted. If the amount of water diverted is to be reduced then it would be better to remove some licences for diversion to buy up those licences rather than to be supplying more water to the existing licence holders for them to make their economic benefit from. We need to actually reduce the number of licences, as was the original idea of the Murray-Darling Basin Plan.

The CHAIR: Yes, and within the New South Wales border rivers system itself, do you believe there are those water licences to be bought? Do you think there is capacity in the system to do that? Mr Norris, feel free to jump in at any stage as well, obviously.

Mr NORRIS: Well, I do not really know much about how much water has actually been taken out of that system. I have read the documents on it. Without actually going and have a look at it, I could not really tell you how much is there. But there does seem to be a lot, at this point in time, even with the river so low as it has been over the last couple of years—in fact, there has been no flow for two years, full stop—but most of these people are not being able to extract water anyway. If it was to be removed, I do not think it will make much difference.

Ms BOYD: In other words the community is used to surviving on a relatively low level of reliability of supply. The community has some resilience but that resilience has been greatly reduced by the drought conditions, but the resilience of people down the Barwon-Darling and the ecosystems down there has also been reduced and it has been reduced to a far greater extent by all of the cumulative impacts upstream. If done carefully, then it is possible to look after the communities of people at the same time as looking after the communities and ecosystems further downstream.

The CHAIR: Thank you. Would either of you care to comment—my next question after this will be to you, Mr Gray and this will be my last question on the Mole River Protection Alliance—on what the environmental

impact would be? I understand that the dam is looking at holding potentially 100 to 200 gigalitres. What with the environmental impact be of removing 100 to 200 gigalitres from the Mole River downstream at any given time?

Ms BOYD: The dam would store that amount of water. That is not to say that it would remove that amount of water at any given time. The storage will occur as the inflows allow it and in relation to whatever rules are included on outflows from the dam. But it can only release as much water as can go out the hole at the bottom of the dam unless it spills over the top because they are not proposing a gated structure, they are proposing a rock wall and spillway off at the side. It will have an impact on the ecosystem downstream and those impacts will depend on the nature of any rules for looking after the environment.

It will have impacts associated with whatever water is trapped and the lack of high flows until such time as it overflows from the spillway. That will affect the River Oak trees. The dam will also tend to trap silt and sediment and then when it does overflow it will have a shortage of silt, sediment and rocks and so on. At times of very high flow, that will mean it tends to pick up rocks and pebbles and it is likely to erode the bank slowly over time beyond whatever reach they put rock walls on, so it is likely to cause some damage to the ecosystems along the Mole River itself.

It will also change the water quality in some ways we do not quite know about, but it will quite probably affect the temperature of flows because the existing efforts on other dams to reduce cold water pollution have not been highly successful. Dams tend to increase the suitability of the water to have a large amount of blue-green algae that has to be managed when they are releasing. The flows will be [audio malfunction] downstream but within the dam reach it will be a still water environment, so it will no longer be suitable for the Purple Spotted Gudgeon, a threatened species, which occurs within the dam site at present. Whether or not the flows downstream suits species such as Purple Spotted Gudgeon will depend on the rules that are put in place to minimise the impacts of the dam. Those rules will also impact on how much water can be used for irrigation purposes, or any other diversion purposes like town water supply.

There will also be impacts from the reduction of those high flows, especially after droughts. At times like we are in now, which is actually still a drought in this area, it will take a very long time in conditions such as we have now with the evaporation as well for the dam to fill up and spill again. Therefore, the ecosystem downstream will be missing out on flows until such time as it can spill again. That includes places such as Boobera Lagoon which WaterNSW's own website says is possibly the most important Aboriginal site in south-eastern Australia. Boobera Lagoon is already impacted by reduction of high flows that are needed to get into the channel that supplies the lagoon and by the floodplain harvesting which blocks and often takes away much of that flow.

The current discussion about floodplain harvesting and how the licenced amount might be changed has some focus on attempting to marginally increase flows to Boobera Lagoon. This current proposal would have the reverse effect by reducing high flows. It will also have similar effects on the lagoon and other aquatic ecosystems and the wetlands along the Barwon River that depend on high flows. It is a cumulative effect on top of all the existing cumulative effects, and that means effects on the fish and people down the Barwon and Darling.

The CHAIR: Thank you very much. Ms Gray, thank you for your submission. It was very comprehensive and good. In your submission you suggest that WaterNSW has a conflict of interest as a proponent of these fast-tracked projects. Could you expand or explain why you believe there is a conflict of interest?

Ms GRAY: Yes, absolutely. They are a State-owned corporation and their principal objective is to make profit. Everything that they do impacts the environment. However, the principal objectives in the 2014 Water NSW Act do not actually mention the principles of ecologically sustainable development. It is not until you go to the secondary objectives, right down the bottom, the very last part of their secondary objectives, it says, "If actions happen to affect the environment, we should look at the principles of ecologically sustainable development." But every action that they do really does impact the environment because they are running so many regulated rivers, which impact on unregulated rivers, of course.

Protection of the environment is not high on their corporate objectives. They are out to make money and these projects that they are putting out there, for example, the Macquarie re-regulating storage, is only for general security customers. It is not really very much water compared to what they can take out in most years, but the main purpose of that structure is to increase the amount of water that WaterNSW has to sell.

The CHAIR: Expanding on that a bit more in relation to the Macquarie Marshes, on page 8 of your submission you talk about the planned environmental water. It says that WaterNSW's:

> … EPBC referral (page 6) WaterNSW says "Environmental watering flows to the Macquarie Marshes will be unaffected by the operation of the project" – this is a narrow and misleading definition of environmental water, which should include all forms of free flowing un regulated water in the river.

Why is it an issue and what is happening here, do you think?

Ms GRAY: The way that the industry and WaterNSW see the river is that all water should be licensed and controlled and regulated, including the environmental water. But there is a lot of water that exists outside of licensed New South Wales and Commonwealth environmental water holders that is benefiting the environment. Tributary flows and these cancelled rain rejected orders, they are all a form of free-flowing water in the system and they perform the type of ecological services that dam releases do not have a chance. The river still relies on those natural flows that have all the triggers—the ecological triggers, the right temperature, the seasonally correct—that allow migratory birds to breed and fish to breed.

What we are seeing increasingly is that WaterNSW have been trying to tell us that if there is technically more water on paper in a licensed environmental water holders account, then that is better for the environment. However, all of the water that is coming into general security accounts, whether they be environment or irrigation, comes from these free-flowing forms of water which are a type of planned environmental water.

The CHAIR: I see. You are saying WaterNSW sees just the planned environmental water as the water for the rivers, everything else is not really environmental water. I have heard the term "wasted water", is that what you are getting at there?

Ms GRAY: Yes, which is outrageous to think that water that is not licensed is wasted.

The CHAIR: Yes, I understand. We will move to questions from Government members.

The Hon. SHAYNE MALLARD: My first question is to Ms Boyd and Mr Norris. Would you agree that, in general, New South Wales has some of the most strident environmental protection laws and planning laws, if not in the country, in the world?

Mr NORRIS: That is an interesting question. From the perspective of this point in time with what I feel like this dam is going to affect, I would properly disagree with that.

The Hon. SHAYNE MALLARD: Okay. Would you like to elaborate on why you do not think we have strident environmental protection laws and planning laws?

Mr NORRIS: If you look at what this dam will do to this river system which, believe me, is registered with the Murray Darling Basin system as a worthy site, now, with the dam that is proposed, I can see this river system basically failing.

The Hon. SHAYNE MALLARD: But I put it to you that the dam has not gone through the planning and environmental assessment stages. It is only at the business case stage, so it has not been tested against those—what I would contend are quite rigorous—environmental and planning processes.

Ms BOYD: One of the issues here is that the processes are being raced through and do not include public consultation about the idea of spending a lot of money on one big project prior to developing the details of that project. Under the critical infrastructure legislation, the whole process is to be sped up. I appreciate that it still involves an environmental impact assessment but that appears to be very much at the tail end. We have the impression, from the WaterNSW website in particular, that the Government just expects to push these developments through and that the planning procedures are just something to be dealt with as a procedure that is a necessary procedure to be ticked off, not one that is truly consultative.

It does not involve the community in working out what they might best benefit from. The planning side of it is not happening as far as the community is concerned. It is only an environmental assessment that is being in done in any way that will end up consulting the community well. We do not have any information about how much environmental assessment of downstream impacts is proposed to be undertaken.

The Hon. SHAYNE MALLARD: Some of that is opinion as opposed to fact. Your opinion is that it appears that the Government is just ticking boxes for the environmental assessment, but it is not fact. I guess that is contention. I have another question for Ms Boyd. During this drought or the last one did you run out of water? My family ran out of water at their farm in Dubbo in the millennium drought. Did you run out of water?

Ms BOYD: Personally I did not run out of water. I live in a town that was under level 5 water restrictions and is still under water restrictions. I am very well aware of the impacts of drought.

The Hon. SHAYNE MALLARD: Okay, that is good. What is your opinion then on how the Government should improve water supplies to address what inevitably will be future droughts, particularly with climate change, to guarantee water for communities. As you said, you are on level 5 and, as I said, my family ran out of water in Dubbo on their farm. How do you think Government should respond to preparing our communities to be resilient for future droughts?

Ms BOYD: I think that we should make better use of the existing dams that we have by changing the way that the large dams are managed so that a greater reserve is kept for the priorities that are listed in the current Water Management Act, for example, more water kept aside for town water usage and stock and domestic usage. We need to give more priority to assisting people in towns and communities to improve their water efficiency so that we are not wasting as much water. The amount of water usage by individuals varies enormously. I am amazed at how much more water some people in my town consumed for the average to be as high as it was given how little I was using. We can do better on that front, and if we do better on that front on a regular basis then there will be more water in the dams when we need it.

We also need to assist the agricultural users to improve their efficiency of use by reducing, for example, the evaporation off storages. We must change our attitudes to the river system and the management of water so that it is seeing more of the whole river system so that everybody is trying to contribute to sharing the water more effectively. There are some good proposals in the draft Border Rivers Regional Water Strategy that need a lot of government focus to enable them to achieve the objective that you have suggested, and I share with you, of making things a lot easier for people in future droughts.

The Hon. SHAYNE MALLARD: The challenge is the that dam infrastructure frankly failed most communities in the last drought and the ones before that as well. It is ageing infrastructure and the populations in those rural centres are growing, as is agricultural use. In my view, the measures you outline are part of the solution but they are already underway—getting people to be more responsible with their water, getting agricultural users to cover over their channels and so forth. Do you agree that that will not go far enough for the next drought?

Ms BOYD: The level of effort going into that at the moment will not go far enough but communities can be encouraged to do more. We have to work with people over a period of time and through the higher flow, wetter periods so that we all get used to using less water and having efficient ways to live happily on the limited amount of water that is available. Things are going to get worse because of climate change; we all have to do better with less. I know that irrigators have been putting in efforts with improving their farm efficiency for many years and they can continue to put that effort in. Town people have tended to get slacker and not put as much effort in but we all need to work together to come up with much better ways of living with the declining amount of water that is available.

We cannot make more water; we just have to use it better. In terms of people in isolated situations, there are ideas such as the one that was presented to the Committee in a submission about putting a panel on your roof that sucks water out of the atmosphere and gives you water just for drinking. That does not meet the needs for gardening and things like that but there are more and more innovations and we need to encourage those innovations rather than use old-fashioned thinking.

The Hon. SHAYNE MALLARD: No doubt technology is part of the solution as well. I now have some questions for Ms Gray. Are you there, Ms Gray?

Ms GRAY: Yes.

The Hon. SHAYNE MALLARD: What is the current condition of the fixed crested weir at Gin Gin? Can you explain the difference between the current fixed crested weir and what is being proposed to be built at Gin Gin?

Ms GRAY: The current old weir was built in the late 1800s and is a nine to 10 metre concrete wall. The first flood that came after the construction of the weir obviously backed the river up significantly and became quite a danger and quite a threat. The local story is that the locals put some gelignite in it and put a hole in it to ease the danger that the old weir had created. So now it is about four to five metres high and it is old and crumbling and it needs to be addressed. It needs to be either removed or it needs to be replaced. There is no doubt about that. There needs to be a fishway put on that weir as there has been a legal requirement to do so from WaterNSW from back in 2009 when there was an agreement made when Burrendong Dam had a safety upgrade.

There was an agreement made as an environmental offset that three fishways would be built on the Macquarie—one at Gin Gin, one at Marebone Break and one at the Gunningbar Offtake. That legal obligation that WaterNSW has, that even that they made, has not been met for almost a decade.

The Hon. SHAYNE MALLARD: So you are saying that the weir— Did you say 1890s?

Ms GRAY: Yes, apparently the late 1890s. No one seems to know exactly but around that time.

The Hon. SHAYNE MALLARD: So a concrete hole in it and it only half fills up. The water goes through the hole, does it? It does not crest over the top.

Ms GRAY: No, no. It has been completely levelled off. The sides of it are still extremely high, which is about the same height as the new structure is proposed to be which is extremely. But along the river itself, the stretch, the width of the river, it has been evened off to about four or five metres high.

The Hon. SHAYNE MALLARD: But it crests over. That is why it is called a crested weir, I guess, because water goes over the top. It sounds like you are an expert on this. How many weirs are fixed crested on the river, do you know?

Ms GRAY: On the Macquarie?

The Hon. SHAYNE MALLARD: Well, Murray-Darling Basin I have got here but the Macquarie—

Ms GRAY: Yes, I saw that question asked in the *Hansard* that I read this morning. I think WaterNSW took that question on notice so I defer to whatever answer they come back with.

The Hon. SHAYNE MALLARD: Do you know how many—

Ms GRAY: I think it was 2,000-something. Did I read something like that?

The Hon. SHAYNE MALLARD: Do you know how many do not have working fishways across the New South Wales section of the Murray-Darling Basin?

Ms GRAY: All too many. Well over 10,000 and as I said there was a legal obligation for WaterNSW to— They actually did raise the money in the 2014-17 determination period. Over $50 million from general security customers to build these mandated dam safety upgrade fishways—one at Gin Gin—and they received $13.24 million of New South Wales taxpayers' money specifically to build those fishways, which are desperately needed. No one is denying the need for fish passage in New South Wales. So that is over $60 million that WaterNSW collected between 2014 and 2017 and they decided to re-prioritise those funds and not build the fishways as per their agreement.

The Hon. SHAYNE MALLARD: So the figure you said was around 10,000 structures do not have fishways in the basin. Is that the correct figure?

Ms GRAY: I have heard that. I do not know the correct absolute figure but it is very high. There certainly would be less if WaterNSW had met their obligations to build 11 fishways as part of the dam safety upgrade offset.

The Hon. SHAYNE MALLARD: It clearly has a big environmental impact in terms of the river's health and the movement of fish and wildlife. How many gated structures?

Ms GRAY: I do not know.

The Hon. SHAYNE MALLARD: Okay. Thank you for those answers. I appreciate that.

The CHAIR: Thanks, Mr Mallard. That was fantastic participation by you. We will now go to questions from the Opposition.

The Hon. PENNY SHARPE: I have got a question about your submission, Ms Gray. We had some evidence this morning from the Mayor of Narromine in relation to his concern about misinformation in the public arena regarding how much money flows on the Macquarie that goes to either irrigation or the environment. I just noticed that your—

Ms GRAY: Sorry.

The Hon. PENNY SHARPE: Can you hear me?

Ms GRAY: Sorry, I missed that.

The Hon. PENNY SHARPE: That is okay. We have been struggling with this all day. I will start again. I wanted you to comment on the issue around planned environmental water and the amount that actually goes down the river through the Macquarie. Your submission goes to this and is diametrically opposed to that provided by the Mayor of Narromine this morning. Your submission says that 17 per cent of flows on the Macquarie go to irrigation—no, sorry. You reject the assertion that 17 per cent of flows on the Macquarie go to irrigation and 80 per cent goes to the environment. Can you just take the Committee through that please?

Ms GRAY: Absolutely. That is a long-standing misinformation here in the Macquarie. Yes, the long-term average irrigation take is about 17 per cent—that is in the water sharing plan. But that does not mean that the remaining 83 per cent goes to the environment. Most of that water goes to essential services and essential services means keeping enough water in the river to deliver an irrigation order to the pump. So most of the water in that 83 per cent is used to deliver irrigation orders and that is an important point because environmental water

does not actually get delivered— So for example, if at the moment there is an environmental flow to the Macquarie Marshes and all that WaterNSW does is deliver that water to the end of the regulated system and then it is up to the environment to prime the system if you like—to make sure that the banks are wet enough for the water to actually go somewhere.

The Hon. SHAYNE MALLARD: It is confusing. Can I just ask a clarification?

Ms GRAY: It is quite misleading for anyone to imply that 80 per cent of water goes to the environment because that also includes evaporation out of the dam. It is outrageous to consider evaporation out of the dam as an essential requirement, as environmental water.

The Hon. SHAYNE MALLARD: I am just a bit confused by your answer. If it is being held back for delivery would it not be counted in the percentage going to irrigators?

Ms GRAY: No. It is considered essential requirements in the planning, in the pie graph if you look on the WaterNSW website. It is on page 6 of my submission, the pale pink section which is almost half of the pie.

The Hon. SHAYNE MALLARD: Are you suggesting there is an amount of water needs to be kept in the river so that pumps can work? It is not being extracted, though, because the extraction is at 17 per cent. So there is water that has got to stay there to maintain the level. Is that what you are getting at?

Ms GRAY: So if you are looking at this pie graph on page 6 of my submission, essential requirements is almost 50 per cent of the pie. Essential requirements is the water needed for the river to be wet enough for the irrigation order in its full to reach the pump. So if someone orders 200 megalitres, you cannot just send 200 megalitres down a dry riverbed because it will soak into the dry riverbed very quickly and it won't reach the pump.

The Hon. SHAYNE MALLARD: Alright, we might get some clarification.

Ms GRAY: So that is an essential requirement.

The Hon. PENNY SHARPE: But that would also mean the river benefits from that water having to be in the system for delivery, doesn't it? I understand the point that you are making, but there is benefit to the environment as a result of that water being in the system.

Ms GRAY: Well, it is not managed for the environment. It is managed for irrigation orders. It is managed very tightly. We had a situation here in January 2018 when irrigation orders slowed down between the Christmas and New Year period because of holidays. The river actually dried up below Warren and we had fish kills in the Macquarie because there were not enough irrigation orders for there to be enough essential requirements in the system to provide water for fish and they died. WaterNSW is very proud of the fact that it has brought down the management of rivers to be so specific that it only uses—I think it is within 3 per cent of what the orders are. That is the essential requirement that it uses. It runs the river very tight and that water is not managed for environment.

The Hon. PENNY SHARPE: Great. Page 8 of your submission talks about the planned environmental water in the Macquarie Valley. You talk about the EPBC referral, which says:

> Environmental watering flows to the Macquarie Marshes will be unaffected by the operation of the project.

You are very critical of that in your submission. Could you talk to us about that?

Ms GRAY: Yes. The environmental water is more than just what is licensed and ordered and released from Burrendong. That is what I mean by that. All sorts of unregulated, free-flowing water are types of environmental water and serve a really important purpose. We cannot reduce the water in the system to only what is released by the New South Wales environmental water holder and the Commonwealth environmental holder to perform ecological services. It cannot be the only environmental water in the system. There is no base flow. There is no requirement for WaterNSW to provide any water below the end of the regulated system, which is upstream of the Macquarie Marshes. We cannot have a situation where the only environmental water passing the end of the regulated system is the water that is ordered by New South Wales and the Commonwealth. There has to be other water in existence in the environment. It cannot all be licensed.

The Hon. PENNY SHARPE: You point to the objectives under that the Murray-Darling Basin Plan that there is no net reduction in the planned environmental water. Do you believe that these projects will lead to a net reduction? How it does that get resolved between State and Federal governments?

Ms GRAY: Yes. I am concerned about the definition of planned environmental water. The definition in the Water Management Act has got three parts to it; however, a lot of water sharing plans—and they happen to be the water sharing plans where there is major irrigation activity—only include two parts of the definition of planned environmental water. This is an inconsistency which really has to be addressed. At a New South Wales level, we need consistent definitions of planned environmental water in every water sharing plan.

The Hon. PENNY SHARPE: Are you saying that the definitions of planned environmental water are different across different water sharing plans?

Ms GRAY: Yes.

The Hon. PENNY SHARPE: What is your proof of that? I am very interested in that. I asked questions this morning about the fact that there are different operations of dams and credit versus debit. How is it possible that water sharing plans are using different definitions of planned environmental water?

Ms GRAY: Yes. In the Water Management Act, the definition of planned environmental water has three parts to it, but unfortunately there is a little clause underneath it that says only two parts need to be referred to in a water sharing plan.

The Hon. PENNY SHARPE: I am assuming that would be trying to recognise local conditions, wouldn't it? Rather than having to have—

Ms GRAY: I cannot comment on the reason for that amendment. I believe it went through in 2012.

The Hon. PENNY SHARPE: No, I do not know either. Sorry, it is not a test. I am just interested in the lack of consistency around managing it. Obviously, given the impacts with the EPBC and the Murray-Darling Basin Plan and the impact from the Commonwealth, it seems very difficult for us to have a very clear and transparent definition of planned environmental water if it is actually different in a way that we cannot explain.

Ms GRAY: Absolutely. I could not agree more. It is a significant issue. We would advocate strongly that every water sharing plan has the same definition or refers to the full definition in the Water Management Act.

The Hon. PENNY SHARPE: Mr Norris and Ms Boyd, is there anything you particularly want to speak to the Committee or feel we need to know more about that we may have missed through this discussion? Your submission is very good and clear, but is there anything you would like to tell is that you have not had a chance to?

Mr NORRIS: Basically a lot of my issues with the way this dam is being proposed goes back to the Jacobs report itself. It tends to want to look at all the benefits downstream but does not even come close to looking at any of the losses that would be incurred upstream of that interchanging of these licences. There does not seem to be any consistency in the line of approach in that manner. A lot of the assumptions that are made are based on old data, especially for the environmental part that flows into the river. Basically there are so many assumptions about increases in simple things like the available tourism. No-one has actually ever made a connection with what tourism exists on this river [*inaudible*] come here to see a pristine river system. They all seem to think it is all going to be about another [*inaudible*] dam somewhere. To me that is probably one of the main things that I would like to put forward.

Ms BOYD: I think there is the impact of the process of rushing through with this business case in a rather secretive way on the local community. As someone who is not actually a landholder on the river, I have an overview from all of the interactions I have had with people who live on the river and see how hard it is for them and how frustrated they are that they are not involved in any discussions about what would really be good for them and the local community. People have, for example, suggested that what Tenterfield needs is a youth centre. But money is being put into something which is likely to move economic values downstream. If, as we suspect, people have to pay for management of the dam under the usual Independent Pricing and Regulatory Tribunal procedure, then the people along the Mole River who get water at present from the unregulated river system, under the type of water licences that apply to them at the moment when the water is going past at the level that lets them take water would have to pay a lot more.

It would probably be very costly to them. It is likely to be a shift to people downstream who might be able to afford to buy up licences. People upstream might have to sell licences. A shift in community value might occur if the dam proceeds. None of this makes very much sense. It seems as though people are being left out of the equation. It is just computers to generate the equation. The information that is being collected from the dam site on a regular basis is obviously very difficult for the landholders, who have, as a result of their willingness to contribute to community, agreed to allow people to come onto the properties to collect information on a very regular basis. There is information being collected, but it is all secret as to what is being collected. The community is clearly very uncomfortable about the whole process, and we are very uncomfortable about the environment being affected.

We love this river. We love the rivers downstream. We love the benefits that people get from the natural flowing river, which seem to not have been taken into the equation when deciding to go ahead with this business case. I am very concerned that the people along the Barwon and Darling river system are left out even more, that there will be cumulative impacts from changing the flow regime from one less of these rivers contributing down

there. This is a river system that has high environmental value. It has species in it that many other river systems have not. It should be something that is valued as it is, and it should be contributing to an increase in the health of the river system downstream. We fear that it will be a decrease in the health of the river system downstream.

We do not feel that the Government is currently really taking a careful note of either the people's needs or the environment's needs. We appreciate that an environmental impact statement is to be prepared, but there is no process that is releasing information gradually and helping involve the people. WaterNSW has finally come and met with the landholders who are affected at the dam site—they are, at last, being recognised as people—but people further downstream are extremely frustrated.

The CHAIR: Thank you very much, Ms Boyd. That is excellent. That is also the end of time for this session and, in fact, the end of our hearing today. I thank the three witnesses for making the time to appear before this inquiry; it was very useful evidence. Thank you very much. That is the end of today's hearing.

(The witnesses withdrew.)

The Committee adjourned at 15:48.