LEGISLATIVE ASSEMBLY OF THE NORTHERN TERRITORY
Sessional Committee on Environment and Sustainable Development

Committee Members:

Mr Peter Chandler, MLA	Member for Brennan
Ms Marion Scrymgour, MLA	Member for Arafura (Chair)
Mr Peter Styles, MLA	Member for Sanderson
Ms Lynne Walker, MLA	Member for Nhulunbuy
Mr Gerry Wood, MLA	Member for Nelson

Apology:

Mr Michael Gunner, MLA	Member for Fannie Bay

PUBLIC HEARING, THURSDAY 19 AUGUST 2010

Water Resources Division, Department of Natural Resources, Environment, the Arts and Sport

Witnesses:

Ms Diana Leeder	Controller of Water
Mr Ian Lancaster	Director of Water Resources

Madam CHAIR: I declare open this public meeting of the Sessional Committee on Environment and Sustainable Development. Our inquiry arises from a reference to the committee by Alison Anderson MLA, former Minister for Natural Resources, Environment and Heritage.

I welcome Ms Diana Leeder, who is the Controller of Water, and Mr Ian Lancaster, who is the Director of Water Resources, from the Department of Natural Resources, Environment, the Arts and Sport, and I thank you both for appearing before us today. Although the committee does not require you to give evidence under oath, these hearings are formal proceedings of the Parliament and consequently they warrant the same respect as proceedings of the House itself. I remind witnesses that giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Although the meeting is public, witnesses have the right to request to be heard in a private session. If you wish to be heard *in camera*, please advise the committee prior to commencing your answer. Today's proceedings are being electronically recorded, as soon as practicable following this meeting, the transcript of your evidence will be uploaded to the committee's website, but not before you have proofed it.

I remind Members of the committee that personal opinions should not be sought from public servants who are appearing in a professional capacity.

Before we start our evidence, for the benefit of our witnesses we have: Mr Peter Styles who is the Member for Sanderson; Mr Peter Chandler who is the Member for Brennan; Mr Gerry Wood who is the Member for Nelson; Ms Lynne Walker who is the Member for Nhulunbuy; and myself, Marion Scrymgour, the Member for Arafura.

Do either of you wish to make an opening statement?

Ms LEEDER: Thank you, Madam Chair, do you need us to identify names when we speak?

Madam CHAIR: Before you speak if you can say your name and also your title, thank you.

Ms LEEDER: Diana Leeder, Controller of Water Resources. Madam Chair, we were prepared to answer whatever questions the committee might like to raise with us. Water Resources is a fairly broad-ranging subject and so rather than prepare a statement as such - - -

Madam CHAIR: All right. We'll just go straight in to questions. Okay. Members of the committee, are there any questions? I suppose this meeting was following on from where we have had the various industry people come in; we talk about development of that industry, I suppose water plays a big component of that. Mr Styles, you can come in any time you like!

Mr STYLES: Thank you, Madam Chair. Hello, I am Peter Styles. On our questions, the first question is water reserves, Alice Springs. Can you advise the committee on what water reserves there are in Alice Springs? We all hear conflicting stories about how much water is there, the current capacity, the future growth in relation to the 2030 plan that the government has. Where are we going to go with the water reserves? How far is the table dropping? What's the salt content? Those sorts of questions. Can you give us a general outline overall and then from that I think we can probably ask a whole raft of questions?

Ms LEEDER: Madam Chair I will ask Ian Lancaster, the Director of Water Resources, to answer the technical questions.

Mr LANCASTER: Alice Springs has had a Water Strategy in place since 2002 and that strategy outlines the sustainability of the water resources in Central Australia, primarily of the main aquifer that supplies the reticulated water supply so is accessed by Power and Water Corporation and it is actually accessed by only one other user for agricultural purposes.

The Strategy sets out the longevity of that resource, which is supposed to last for 320 years if current usage remains the same, the idea being that current usage is very high, as it is in most of the Northern Territory, and government and the departments and Power and Water Corporation are actively working on trying to reduce that level of usage by customers of Power and Water Corporation in order to leave that usage at about the same level. So we are looking at growth, but we are looking at that growth being taken up by some reduction in usage. As I say, usage is very high.

The policy that is in place is what we term an 'Intergenerational Sustainability Policy' where no more than 80% of any resource can be used in less than 100 years. So that is the policy that we have applied to the Ti Tree area where, as you are aware, there is some agriculture and we are currently undertaking planning in the Western Davenport, which is around the Ali Curung region, where there is quite a lot of interest about irrigated agriculture and down in the Great Artesian Basin.

The usage to date, since that strategy has been brought in to place for the past eight years, is basically on track with that prediction that it will last 320 years. And I might add that 320 years is based on that ability to extract water resources at depth. And so although there is more water in that aquifer, the Mereenie, it would become economically unviable with today's methodologies to extract water below that depth. We are already extracting from quite a considerable depth.

Mr CHANDLER: I have got two questions in regard to Alice Springs. One is: can you give us any information on the process of pumping the treated effluent back in to the aquifer and how that may have a positive impact in future? The second question would be in regard to the uranium mine that is proposed 20 kilometres out of town. I have seen drawings showing that the water table, I suppose you would call it, the aquifer, is flowing away from the town where the mine is and I have seen other indicators that it could, at some stage in the future, without anything that they do out there could contaminate the water supply.

Madam CHAIR: It depends who has done the map, Pete.

Mr CHANDLER: Well, this is right and you guys are the experts, so what can you tell us about the impact of a mine 20 kilometres from outside of Alice Springs and would it have an impact on the aquifer?

Mr LANCASTER: To go to your first question, the Arid Zone Research Institute recharge situation with the Power and Water Corporation, I have just received another report from Power and Water Corporation about the recharge. it is going quite well and they are not recharging as much as originally estimated at this stage, however they have done a lot of work and a lot of research in collaboration with CSIRO; there is a CSIRO report out, publically available, as well. That system seems to be operating generally as expected. As I say, the recharge is not quite as much but that just means an extension of the area of ponds that they use to recharge. I know that the ponds were located deliberately in an area that does not recharge as quickly so as to give that water cleansing ability more of a chance to work properly. So we didn't choose the areas where we did the work and looked and the water would go straight in to the aquifer; we chose those with finer grained soils and sands to allow that filtration to happen as expected. And it has probably worked a bit better than expected, in other words not filtering through as quickly as we expected.

The quality of the water is very good. It is removing all of those contents of the water that we expected – the salts, the pathogens; I mean, it is primarily treated water so the quality is not really bad; it is certainly not raw sewage that we are recharging.

The operation is licensed under the *Water Act*. They have a recharge licence and that has particular conditions about reporting and the likes and those licences are issued for relatively short terms. I am not sure, but I think they are only two-year. I would need to check on that, how long they are issued for. But yes, that is going well.

Finally, we are about to do just a little bit more investigative drilling down there and those holes, once they are drilled, we will actually be handing over to the Department of Resources to start some irrigated agriculture projects at the Arid Zone Research Institute to proof up this concept of recharge and consequential use. So we are all pretty happy with the recharge project in Alice Springs.

Mr CHANDLER: Excellent. And the second part, the uranium mine?

Mr LANCASTER: And getting on to Angela Pamela, my understanding is that the groundwater systems where the uranium is and where the mining is potentially going to occur are not connected to the Mereenie and Parcoota systems, so there is no hydrogeological connectivity between where they want to mine and where the town water supply is. Be aware that there is naturally occurring uranium in the town water supply and many other areas throughout the Northern Territory.

Madam CHAIR: In Alice Springs?

Mr LANCASTER: Absolutely. There is uranium in the Alice Springs water supply. Uranium in very small doses is expected and is not harmful to human health.

Madam CHAIR: What are you looking at me like that for, Member for Nelson?

Mr WOOD: No, it's all right. Continue on.

Madam CHAIR: We will leave the uranium debate for another forum.

Mr LANCASTER: As in many other parts of the Northern Territory where there is quite high levels of arsenic and all sorts of things; we live in highly mineralised country in the Northern Territory and, naturally, ground water will absorb those minerals in a naturally occurring place. In fact, it is called NORM: naturally occurring radioactive material. So our research to date shows that the risk of contamination of the water supply is very low from the proposed mine.

Madam CHAIR: From where the mine is, or where the present site is.

Mr LANCASTER: That's correct.

Madam CHAIR: Member for Nelson, I know that you are keen to ask some questions.

Mr WOOD: There is no sarcasm on this committee! I am not sure who will answer this one, but it's about the Mataranka Water Allocation Plan. We all know about it; I just wanted to know what stage it is at, at the present time? And I will just throw an extra question in there. I was visiting Mataranka Station the other day with the Charles Darwin University and I just asked them whether they would contact yourself, Diana, about the possibility of having some water allocation for their stations. So I just wanted to know where is it at and has the university contacted you?

Ms LEEDER: I can answer that. The planning process is still continuing and we are expecting the plan by later this year or early next year in terms of the completed plan and public comment. And in terms of the CDU contact, yes, the gentleman has made contact with the Water Resources area and we are looking at what is the likelihood or the possibility of there being an allocation made for that purpose.

Mr WOOD: That's good. The other is a bigger question. I suppose at the moment when we are looking at agriculture and I am still a fan that the Northern Territory can grow a lot of crops, but we have tended to concentrate on bore fields or aquifers. What work is being done in water harvesting and even things like reduction in evaporation methods? Having lived on the Daly for a long time and going through umpteen floods, it beats me how we can't actually remove a proportion of that water without doing a negligible effect on the environment during the Wet Season and store it and use it for irrigation in the Dry. So is there any work being done that?

Ms LEEDER: I will refer that to Ian who is across what might be being done in other agencies because it is not the type of work we do in terms of assessment of water resources or allocation of water resources, but Ian is probably aware of more.

Mr LANCASTER: There has been some work. One of the primary goals with regards to Wet Season harvesting of surface water is to ensure that we don't reduce those peak flood levels, which are really important to environmental sustainability to keep the billabongs and the off stream water resources in the state that they are currently in. But in saying that, I believe there are lots of opportunities to harvest Wet Season flow in rivers, and we have done some research and investigation in to that: where can you take water of the system and not impact on those flood levels? And, very basically, if you take some water out of what we call 'the back of a flood', so you have already had your peak and then you start pumping. So as the river levels are starting to fall, that should not impact adversely on that flood peak as it moves down the system.

We have done some work in collaboration with a unnamed but quite a large agricultural development aspirant in Katherine who has looked and has had a private consultancy firm look at Wet Season harvesting, storage and then, in fact, at managed aquifer recharge to deal with that evaporation aspect that you mentioned, the idea being that if you took some water out in the Wet and as soon as the Dry got in place and the aquifer started to go down, you would actively manage some recharge in to the system and get a credit is the theory behind that. So if you put a megalitre back in to the aquifer, that is a credit and you can take it out of the aquifer perhaps not in that exact locale, but very close by.

One of the issues is storage. Building a storage that actually holds water is difficult in most of the country because it is so porous and I have done a little bit of research into lining dams with plastic or bentonite clay line and the economics become very difficult with larger storages such are used for cotton and other crops in Southern Australia. These dams are quite massive and to line them would be economically unviable.

There is opportunity, Gerry, I believe, when you head down further in to the flood plains where you get blacks soils, which is what all the cotton country is like. I worked down there for 10 years prior to coming to the Territory 22 years ago, so I was only a young fellow then! But in that country, you can dig a hole, pour water in and it will basically self-seal because it is so full of clay. In our environs, in the Katherine area, Oolloo, as you know, you can pour a lot of water in to a hole and it will just keep going through. So there are those issues to overcome, but I certainly believe there are opportunities there and we have done a little bit of research.

Mr CHANDLER: Just on that, I have just been doing a little bit of research recently in South Australia on the recharging of aquifers as a storage method rather than building a dam and throwing water back in to the ground. So you are experimenting with that in Alice Springs at the moment. Is that something that the department may in future do some more investigation as a possible source for water here in the Northern Territory, recharging groundwater?

Mr LANCASTER: Yes. My answer would certainly be 'yes' if it is okay if I continue. One of issues, however, in the north of the Northern Territory, for instance in Katherine with the Tindal aquifer and certainly with our aquifers here in the Darwin rural area, is they generally what we term 'fill and spill'. So each Wet Season they actually come back to as much water as you can get into them and in recent times when we have had a lot of big Wet Seasons and we are living in very wet climatic conditions, we are seeing more and more free-flowing bores. In other words, the aquifer level is coming out over the top of people's bores and the water is pouring out. So you can't put more water in to the full bucket.

Certainly, in other areas such as the Oolloo, we are looking at that because it doesn't fill and spill across the entire aquifer like the Tindal in Katherine and the Howard East aquifer for instance, fills almost every year. So again, it is case by case where this is achievable. Certainly, we are happy to look at it and have been following on and investigating those sorts of opportunities. But there are other areas where this is simply not possible. As I said, what we have been looking at with the place in Katherine is waiting until the Dry Season completes, the aquifer goes down a little and then we can top it up. So that is an opportunity as well that we are looking at.

Mr WOOD: Just one other question. You talk about black soils and water, Lake Argyle is fed basically from Northern Territory waters or a fair percentage - the Negri is a pretty big river and that feeds in to it. But it is a fair bit of the catchment area still, the Northern Territory - - -

Mr LANCASTER: It is.

Mr WOOD: Do we have any control over Lake Argyle from the point of view of use of it as the water resource back in to the Territory? I am talking about Ord River Stage 3 here, but a lot of that country you were talking about, black soil country, is around Amanbidji and that sort of land. So do we have any ownership of any of that water that came from the Territory into Lake Argyle?

Mr LANCASTER: Not as far as I am aware, no, we don't. There is catchment and there is part of the lake when it is at full supply level that goes in down near Rosewood Station and those areas, and I am not aware of any agreement or any application of the *Water Act* that would give the Northern Territory - - -

Mr STYLES: So if you put a pipe in at Rosewood Station on our part of the state and started sucking it out, we would be all right?

Ms LEEDER: You would have to have a licence for it.

Mr STYLES: From the Northern Territory Government? Given that part of that water resource is on our side of the border. I just pose an interesting question.

Madam CHAIR: And you are right. It is an interesting question and I suppose it would be interesting cross-border discussions about water on this side of our border should be our water and - - -

Mr WOOD: Well I told the *Country Hour* in Kununurra that they should be grateful for our water.

Madam CHAIR: Has there been any discussions at all in relation to that, Ian? Do you know, whether at Ministerial Council or the Natural Resource Boards? Have there been discussions about that issue of water resource?

Mr LANCASTER: Not that I am aware of at all. We are currently in discussions about, as you said, Ord River Stage 2 where there may well be in the future some cross-border. Certainly from a national perspective, there is a lot of work being done on trading between jurisdictions obviously for the Murray-Darling Basin. But those rules and regulations will apply to all jurisdictions.

Madam CHAIR: That might be something we could do. We could trade our water on to them there, feed into the Ord.

Mr WOOD: Can I just ask, then, has there been any work – I am not recommending large dams, but I have always felt that there is a potential for smaller dams in certain strategic parts of even the Daly that could store a certain amount of water and would just overflow. Because you said the soil is porous, but there are other areas where it is obviously rocky up in the hills of the Ferguson, the Cullen. Has there been any work done?

I mean, we have got to a stage I think in life where everyone goes: 'Oh dams are the end of the world'. Well, they might not be the end of the world; it might be how they are designed and where they are designed, the size of the dams. We seem to have sort of said 'No, no', when maybe we need to revisit that and say: 'Can we harvest a percentage of water using smaller dams upstream', which is probably going to have less potential impact than downstream. Is that still something that the government looks at as a potential way of storing water for agriculture?

Mr LANCASTER: No. There is no current work looking at potential dam sites anywhere for that reason, Gerry. As you know, it has been many, many years since dams were on the agenda, any building of new dams. I am certainly aware that there was a lot of work done in the 1960s and 1970s and there are quite a lot of dam sites that have been investigated and that work is still around in all sorts of areas. But there is no current work with regards to damming rivers; the only work that we have been doing in more recent times is with regards to surface-water storages on cattle properties and the likes, and I am talking more about tanks for cattle watering; no work done on putting dams in rivers and streams for irrigated agriculture.

Madam CHAIR: If we look at the Katherine River, which flows into the Daly, if we stick to that sort of area first and then I would like to further just explore Central Australia and then the Top End, but if you look at that whole Katherine River and that catchment area, just flowing on from what you were saying, the top part of the catchment of the Katherine which then flows in to those smaller catchments down in the Daly, there has been no discussion about how maybe - not damming the river, because I remember if you say the words 'We are going to dam the Katherine River' God! I remember mentioning it once when I was Minister and people went in to a big spin about all this damming. But that same concept, storage, some way in which to store this because I mean people have got to start to thinking water is a finite resource. So we have got to start preparing for the future and if we want industries like the agriculture industry, horticulture - these industries to then sustain themselves, we are going to have to look after water and look at other ways rather than closing off the debate and we can't talk about dams, but the whole issue of storage - is that something the department is looking at as part of the strategy of looking at how we manage water in to the future?

Ms LEEDER: I wouldn't say that at the moment the department is actively looking at how to store probably because that flows as a natural consequence from when we do the Water Allocation Planning and get a greater knowledge of actually the amount of available water and then of the flows to then get look and have some discussion with our colleagues in the Department of Resources about areas in which we need to be addressing that. So we have had, as you do, around the table discussions about 'What will we do when….', but in terms of formal work, no.

Mr CHANDLER: Could I just ask then, one question? Can you give a ball-park figure on the raising the wall of Darwin River Dam? I know this is Essential Services, but it is still water. How far does that push it back until we would be looking at another resource? Does it give us an additional 10 years or 20 years, considering our growth?

Mr LANCASTER: What I can say is as a part of the raising of the dam wall, their licence was increased from 40 gigalitres extraction to 49. So that is an 18% increase in the amount of water that can be sustainably taken off Darwin River Dam. I am not sure how much longer with population trends that will last us, but you can keep that in mind that it is about 20%. The other point is that my understanding from Power and Water Corporation, and this is second hand so it certainly is not gospel, is that we are using approximately 90% of that available supply today and so there is still not a lot of water left at the end of each year.

And the other issue that I am aware of with Darwin River Dam, having looked at the statistics and the hydrology, is that the dam has been filling and spilling I think it is eight out of the last 10 years. But prior to that, that dam didn't spill for many, many years in a row. And so my concern and what I have to keep in mind as Water Resource Manager is that although we are living in wet climatic conditions now, that certainly wasn't the case throughout history and I am sure won't be in to the future, so we need to keep that in mind.

Madam CHAIR: We have had drought periods in the Top End, which people don't think can happen.

Mr STYLES: You are not using the resource at Manton Dam, obviously. Is that just held as an emergency reserve? What is the status of Manton Dam at the moment?

Mr LANCASTER: Again, I am happy to answer. I will just give you the numbers there again, so you have got an idea of the size, because Manton Dam has a licence to extract seven gigalitres. So seven again is about a 15% increase.

Madam CHAIR: So that is on top of the 49?

Mr LANCASTER: Yes, on top of the 49. So they could take 56 gigalitres if they had the ability to take the water from Manton Dam now. Power and Water Corporation has been doing water quality - water quality is probably the primary issue with the use of Manton Dam water. The two dams are significantly different and Power and Water has been doing a whole lot of investigative work over the last two years because they have asked the Controller for permission to basically use that seven gigalitres to see what happens to the water quality as you lower that dam. It does impact quite severely.

Mr STYLES: So under a licence at the moment, you are actually examining and testing that particular theory?

Mr LANCASTER: That's correct.

Ms LEEDER: The Power and Water Corporation are, yes.

Mr STYLES: Are they actually pulling seven gigalitres out to test it, or are you just pulling - I mean, to me, you would have to pull seven gigalitres out if you want to see what it is going to do. So they are pulling the whole resource out in some sort of a controlled test at the moment?

Mr LANCASTER: That's correct. Keeping in mind that the seven - I can't recall off-hand what the size of the dam is, but it is probably in the order of 30 or 40 gigalitres. So you are certainly not emptying the dam, but naturally it would only go down maybe a gigalitre or two through evaporation. So, yes, they have actually been siphoning the water over the dam wall - - -

Mr CHANDLER: I think about 18 months ago, I was in a boat down there and noticed how much it had dropped.

Ms WALKER: On a completely different subject, I just had a question for either Diana or Ian around Territory Growth Towns in terms of what your role or relationship is in Growth Towns with Power and Water Corporation, recognising that these places are growing, we have subdivisions of 70 to 90 houses going in some of those communities. So quite apart from their additional consumption requirements that will come with that growth, where we have got those communities that have got community market gardens, can you just tell us a bit about what your role is in that area?

Ms LEEDER: Our role is to actually identify the resource and its capacity there. So since the Territory Growth Towns have been announced, then our emphasis has been on identifying the resources in those areas and filling in the gaps and information where we can. We are also establishing good working relationships with Power and Water to be able to talk to them about how much water they need to extract for existing populations and for growth and how we work together to identify that. Given that there are a number of Growth Towns for which we hadn't done the resource assessment prior to this, then it lags behind in terms of the most desirable outcome from it. But predominantly, what we are doing concurrently with that is working with the Department of Resources to try and map those areas where both land and water come together as suitable for intensive agriculture market gardens and so on and to identify those areas where one or the other capacity is not there and to try and do that as early as possible so that expectations aren't built up that agriculture is going to sustain a particular community when in actual fact the water resource or the soil capacity isn't correct for it. I think fairly soon we should have some mapping products to show that.

Ms WALKER: Just as a further question to that and to try and understand what the scope of your work is, where does it go to then when we are talking about water reuse? I am thinking specifically of treated effluent water. Obviously, there is so much sense in terms of economic sustainability and specifically there is one community on Elcho Island, Galuwinku, that have recently in their market garden lost access to that reuse water, which is fairly nutrient rich, obviously, for what they are growing, just not many root vegetables. So your role in looking at the resource in that area?

Mr LANCASTER: Our role is primarily to do with waste discharge licensing, so Power and Water, wherever they have effluent from a community that is required to be managed, they are required, and it hasn't happened as actively in the past, as there are some systems out there that don't have a waste discharge licence and certainly will because of the expansion. And what I am aware of, through discussions with my colleagues in Environment and Heritage Division, is we are asking Power and Water to look at all alternatives to simply discharging into the nearest waterway and they should include irrigation reuse and the likes. So what we are asking for, prior to issuing a waste discharge licence, is that all alternatives are investigated by Power and Water Corporation. It really it is their role to do that investigation and work out whether it is viable physically, economically, socially etcetera, prior to us just saying: 'Well you can just discharge it here' with no added value. So we are working with Power and Water, but that is our responsibility. Really, it is about waste discharge licensing as opposed to any other work about how it can be undertaken.

Ms WALKER: Thank you. That is very helpful for me.

Mr WOOD: Can I ask a follow-up question on Growth Towns? Just on Growth Towns, it is probably a bit political, but are you saying that we have established 20 Growth Towns without knowing what the water resources are in those communities before we have made that decision?

Ms LEEDER: No, I don't think I am saying that. What I am saying is that in terms of planning for the growth, then we need to be sure how far that growth can go and need to actually understand the sustainability of it.

I think that we may in terms of having established the Growth Towns, people may have made general assumptions that anywhere you have a town, agriculture is and market gardens are a normal part of what can be a sustainable industry there. You would know that from around other established towns that that is not always the case and that some of that work about actually lining up the two resources and their suitability for sustained economic development was probably not completed prior to the determination of which were the Growth Towns.

Mr WOOD: Because it is not necessarily about having market gardens; it is simply about living.

Ms LEEDER: Yes.

Mr WOOD: So is there enough drinking water there for the population? Is there enough to water the parks and water if there is industry there. So you couldn't say for sure that you know whether a town can expand to a certain population - I mean, if someone said 'a Growth Town', what does that mean? Does it grow to another 100 people and has to stop because they run out of water?

Ms LEEDER: I think that is all part of the planning for the Growth Towns in terms of to what size, just exactly the same as it is for Alice Springs in terms of knowing what the water resource is there and then managing for it. The same more detailed work is what we need to do in a number of the towns. So we have base information for anywhere where there is a community, but in terms of how far that can grow – Ian, is that your understanding of it?

Mr LANCASTER: Absolutely, but, if you don't mind, I would just like to add to that throughout Australia and the Northern Territory, of course, when a lot of these towns were established, the criteria for sufficient water resources is that you could drill a hole and extract enough water for the town rather than looking more holistically about the size of the resource and the sustainability: how many holes can you drill and how much water can you take out in a sustainable fashion, keeping in mind that there are environmental and cultural requirements for that water more often than not as well. So in the past we would just go and drill a hole, pump-test it and say: 'Yes, you've got 10 litres a second and that will feed 100 people' and walked away. Whereas now, we will assess the entire resource, the size of the aquifer and the other users, particularly environmental and cultural. So we have had quite a shift in only the past 10 years or so, since NWI and COAG 1994 to this new way of doing water resource assessment. So we still have a lot of work to pick up on those new assessments.

Mr WOOD: Nguiu is a good example. They are going to put another 95 houses or so many in a new subdivision.

Madam CHAIR: I was just going to get to the Tiwi Islands because I think the Tiwi Islands, unlike other places - and I think that this is where there will be a concern because on the Tiwi Islands, as I understand, there has been quite a detailed water study on Tiwi. The Tiwis have probably the most detailed of any community about their water resources and what the depths of those aquifers are. So you can plan there in terms of the growth of those communities. That blueprint is what should be translated across to all of these other communities because places like Yuelamu in Central Australia where you establish a community and they have run out of water and then you have got to truck water in because you can't move the community or ship people out. We have got to avoid that mistake and it is going to become a reality as more and more of these communities grow.

So Ian or Diana; are there any moves from the department to look at, through the Growth Towns process, to develop, I suppose, the same water use study like on the Tiwi Islands to some of these Growth Towns? I actually think that that is probably a fantastic blueprint with water resources. They have never got the pat on the back for that, but it certainly a fantastic document.

Mr LANCASTER: Yes, I agree entirely. That resource investigation was done in about 2002 and, in fact, we are currently developing a water strategy, which is akin to a Water Allocation Plan. We are deliberately calling it a Water Strategy because there are so many different resources that are accessed on the Tiwi and so the idea is we will do small sustainability plans in consultation with Power and Water who are doing similar things for water supply plans. And so that is a very good example of where we would like to be everywhere else. We have undertaken water studies similar to the Tiwi Islands ones, we have just completed the Gulf one, which will be released very shortly; it has been signed-off. So we have done the Gulf area, including Mataranka and the Roper and all the way down. We have done North-East Arnhem Land, Central and West Arnhem Land, so there are quite a lot of these studies in the Top End.

Unfortunately, we don't have that same information for some of the Centralian areas. However, we have got three projects running down there at the moment looking at paleovalleys, for instance. Paleovalleys are simply old river beds, usually gravelly river beds, quite often quite deep now and often really good water storages. So we are looking at mapping those and working out how much water is available and can they be accessed for development? So there is some work, but in other areas we still need to do some work to get those sort of studies ready and they are the basis for our plan, which, as you know, is the way that we are managing water resources in areas of intensive use.

Mr WOOD: Do you have a role to play? Talking about Nguiu, in my time at Nguiu [inaudible] day and night, water was hard to get, the tank was hardly ever full and I was told the other day there is no metering of water on those communities. Now, I understand Power and Water would be the people that meter, but do you have a role in talking to people like Power and Water about wastage of water and where are we going in relation to that? You can put as many bores out at Mission Hill, Nguiu and keep pumping away, but if there is no responsibility at the other end, we are not really doing the water resource justice. So do you have a role to play in that area?

Mr LANCASTER: Yes, we do because we licence Power and Water in most of the communities. Once again, we are working through that licensing process and licensing some of the smaller communities that haven't been licensed in the past. The reason is that they were considered to be exempt, which is an exemption in the Act about the 15 litres a second and so it has always been should they be licensed or not? We know have agreement with Power and Water Corporation that regardless of that, we should be moving slowly but surely and licensing all extraction for all community water supplies. There are quality issues as well that we have been discussing with Power and Water Corporation and there are sustainability issues.

Once they are licensed, the licence requires them to be metered and in places like Tennant Creek, the licence requires them to report on that wastage or how much water is used to run the system. So we do have an ability under our Act and our licensing to ensure that Power and Water report on and consequently obviously record and monitor the usage and wastage. As you quite rightly say, it is a big issue in a lot of communities.

That is our role, though. Our role is to licence the corporation, but we have some extra ability to put conditions of licence such as monitoring of groundwater levels, which they do, and water quality and wastage.

Mr STYLES: Is this Power and Water?

Mr LANCASTER: Yes.

Madam CHAIR: So that is probably something that can be looked at with the Growth Towns. So if you are going to start bringing in that sort of framework, you could put those conditions in their extraction licences.

Mr CHANDLER: Just while we are talking licences, the discharge licences, waste discharge, would not just be Power and Water, but it would be subject to licence – it might be a mine, for instance. Can you detail what the consequences are if either business enterprises or in fact companies exceed licence conditions, what are the consequences?

Mr LANCASTER: Certainly. There are penalties set out in the Act and, of course, we approach it like any breach at any point in time. First of all, we ask for explanations and the likes, but at the end of the day, the Act specifies penalty clauses and there can be court action and there has been, although I believe mostly it's been settled for clean up's and fix up's so I don't believe that we have ever had one to go through to completion, but certainly we have had a few instances where there have been negotiations for ensuring this is corrected and actions are put in to place to ensure it doesn't happen again. So that is the normal rate, but yes, there are penalties.

Mr STYLES: Madam Chair, I would like to go back to something you said earlier in relation to the Daly. One part was water is a finite resource so we have only got so much of it and I think the Member for Nelson has hit the nail on the head with a lot of these Growth Towns and a lot of the stuff that we could up here in the Wet Season, however the Dry Season comes and everything has to stop. So in order to sustain some of that, Madam Chair was talking about the Daly. Have you got any idea how many gigalitres of water flows out in to the ocean from the Daly, just to give us some comparisons, like the size of Darwin River? Does anyone actually know or has estimated how many gigalitres flows out of the Daly?

Mr LANCASTER: We do, but I couldn't tell you off the top of my head. The number will be very, very large when that river is in flood. There is a lot, to put it very mildly!

Madam CHAIR: So what comes from the Katherine River?

Mr STYLES: I was just wondering if someone actually had a figure to give us – how many Darwin River Dams flow out there when it's in full flood?

Madam CHAIR: And that we could store.

Mr STYLES: That's right. And the issue is the old story: 'Don't talk about the dam' because it doesn't matter which side of politics you are on, everybody just gets up-in-arms. Ian, what about weirs and low-level storage capacity? Maybe not one dam, but if you had a number of weirs where you are not actually interfering with the environmental flows of that river and also the peaks, because obviously if you go over the weir what is going out there, it's only just on the bottom; it's going to be there anyway. So are we able to look at a system of weirs? Has anyone ever tossed that idea around?

Mr LANCASTER: I am not aware that there has been any investigations into weirs, there are plenty of naturally occurring weirs; we have plenty of large pools that could be accessed. One of the issues with surface water extraction and, I believe, one of the reasons why surface water extraction is not undertaken on a large scale in the Top End of the Northern Territory is the Wet Season flooding. All of your infrastructure either needs to be set very high or removed and quite often, the pipes that you put down to access the water, they will be just simply washed away and the like. So there is that issue with every Wet Season, your pump and your pipes are very susceptible to significant damage - being washed away, quite frankly.

With regards to the numbers, I certainly can provide you the numbers. You would never dam or store the amount of water that runs out of the rivers in the Top End; they are huge amounts. It's all about the impact both up and down stream, environmental cultural flows of dams.

So weirs could be investigated, but as I say, there are a lot of naturally occurring holes in a lot of these rivers that could be accessed without the need to interfere at all with the river or the riverbed. As you know it is a very, how can I put it?

Mr STYLES: Delicate subject.

Mr LANCASTER: Delicate!

Mr CHANDLER: Can I ask a question on the Howard Springs aquifer? I looked at a map and I think, Ian, it may have been you or someone from your department provided me with a map that I took to a school and they loved it so much, they wanted to keep it. So I will have to see if I can get another one, but it detailed all the different aquifers that we have up here. And one of the areas shows salt water intrusion. Is there evidence that when the bore fields out at Howard Springs drop so much each year, what is taken out of them in the Dry, that salt water starts to cut-in on that aquifer and then is it pushed back out in the Wet Season when it fills back up? I don't know if I am being clear, but is there evidence that salt water actually can get in to fresh water aquifers? It is a bit like osmosis, isn't it? Or is it just impossible for it to occur?

Mr LANCASTER: No, there is no local evidence because we don't believe that we have gone that far down the track. The simple physics, I guess, of it is that if you have got a salt water interface with the fresh, which we do have along the Adelaide River, the groundwater is all salty for a significant portion away from Adelaide River. Groundwater is similar to surface-water; if you lower the fresh, the salt will flow, albeit very slowly, it might be a metre a week or a metre a month, but it will flow in. There is a significant amount of evidence from other jurisdictions - the Burdekin irrigation area - is primarily managed for the salt water wedge. They need to manage the fresh water to ensure that the salt water coming from the sea, in that instance, doesn't flow in over the farms and that is their trigger for allowing how much movement you can have. We are considering a similar thing for Lambells Lagoon. We have a salt water wedge that sits around Lambells and our concern is not so much in that area, but it's impacting further extractional impact on Black Jungle and the groundwater dependant ecosystems; the salt would come in and basically destroy those farming areas.

And so the idea is that we put monitoring bores with conductivity meters and we would manage it that way. If we saw the salt moving towards the farming area, we would ask them to back off their level of extraction.

Mr STYLES: Ian, how much higher does your fresh water table need to be to prevent the intrusion of salt? How much pressure needs to be on that system to keep it out? Just as purely an interest thing, how much fresh water do you have to have above the line of salt?

Mr LANCASTER: Difficult for me to answer. I would suggest that it needs to be at a similar level or slightly higher. But again, in groundwater, it is sort of mounds, you don't get edges. But certainly you can think of it, particularly in aquifers, like they have a limestone aquifer, so there are a lot of cracks, fissures and caverns, certainly in those sorts of aquifers where water flows a lot more freely than in a fractured rock aquifer, you have to be more careful. It will flow in quite quickly once that level gets below, it will start to move towards the fresh-water areas. It is difficult to say how much, but I am sure my hydrogeologists can inform you better if needs be.

Madam CHAIR: Does any other member have - - -

Mr WOOD: Just on Howard East.

Madam CHAIR: Go on.

Mr WOOD: Howard East Bore Fields. Have Power and Water allowed any more bores, or are they basically capped at the present time?

Mr LANCASTER: My response would be that I had a request several years ago for an increase in their licence. That request was informally, through discussions – we do try to work with Power and Water Corporation in a collaborative manner. Informally, I said: 'Until a plan is completed, I would be reticent, to say the least, on increasing your ability to extract.' Consequently, they have not been drilling any new bores. As you are aware there is the plan to keep moving out. There is the Stage 1, which is Howard East, Stage 2, Stage 3. But they have put that on hold, thankfully, until we do the plan, which has now commenced.

Mr WOOD: I suppose my political question is that until that happens, do you think the Kamfari can still occur on their piece of land? I can't believe that they say that it is going to affect the aquifer about 12 kilometers from the nearest bore and it is only once a year. I am not sure whether I need some independent advice before I take the argument with them, but that is their argument. They have got this big piece of land that they call theirs under Water Management Zone, miles away from where they extract water and yet they approving people say they can't use that land. I don't know whether you think that there is a risk to that aquifer.

Mr LANCASTER: I couldn't give you an opinion.

Mr WOOD: It just seems an overkill. It is a bit like saying: 'If you put one small dam on the Daly River, the whole place will collapse.' Like if you have one event a year on their land, they're saying that could impinge on the aquifer. I just find that hard to believe.

Mr STYLES: Just one short question. The area we call the Darwin rural area – they're called 'blockies' down there - - -

Mr WOOD: Where the normal people live!

Mr STYLES: In relation to bores there and the aquifer that they feed from, I know that down there they have got some monitoring in relation to usage. How is that progressing and is that going to continue on with the monitoring? And what it the likely result? I don't expect you to answer that, but that is where I am coming from. I don't think it is fair to ask you that question, but what I am looking for is - - -

Madam CHAIR: Well, I suppose Mr Lancaster can either say: 'No I can't answer that' or if he wants to take in on notice and provide the information, he can.

Mr WOOD: He has been involved in a lot of that stuff.

Madam CHAIR: He will know which way to address it.

Mr STYLES: My question is: is that aquifer dropping and are there going to be any restrictions on the number of bores or is some monitoring and recording of usage going to occur across the board? That is really the question because that is the question that everyone is going to want to know the answer to.

Ms LEEDER: Perhaps I will preface it by saying that those sorts of questions and pressures are what usually lead then to the decision to establish a Water Allocation Plan in a particular area to be able to deal with those. So we have recently commenced the Water Allocation Planning for the Darwin rural area both for Howard and East end for Berry Springs. Ian can answer the more technical questions about it, but just in terms of where we are going, that's where we are.

Madam CHAIR: If you have commenced that, how long will that take in terms of being able to gauge and provide that information?

Ms LEEDER: My guesstimate is that, because of the complicated nature of both social and environmental and other considerations with it, it will probably take us two to three years instead of one to two years. Ideally, we would like to say it will take one to two years, but it takes time to provide the community with enough information to understand what the process is about and to be clear that there is an understanding of the science that is used, to engage the community through the Water Advisory Committee process. All of that takes time to do and whilst we start each of our planning processes bright eyed and bushy tailed thinking that we are going to be able to do it in a reasonable timeframe, we always find that responding to community concerns about the need for information and about understanding and also dealing with the fact that if we don't do that, there is a level of misunderstanding grows up because people take information that has been used as part of a planning process in one area and if they are not scientists, then they just presume that one size fits all and that if you know this or you do it in this particular way in one area, you can do it in the other. So there needs to be a fair amount of work done about just ensuring that the community really understands what is known and in some areas, we don't know enough either and so how do to deal with that.

Madam CHAIR: Under the National Water Initiative, and Ian would know this, because I have a bit of a background and still a bit of knowledge on this because Ian and I use to have some great discussions with Malcolm Turnbull. He was fantastic. That sort of process had already commenced around the Howard Springs/Coolalinga area. What was the evidence that came out of that under the National Water Initiative? Were we able to implement some sort of plan to be able to get some sort of indication as to the usage? As the urban encroachment was moving further and further out in to the rural area, what was the impact on the water in terms of usage there?

Ms LEEDER: For that area, then we do have some information. So in terms of how quickly parts of the plan, in terms of being aware of the information can go, then yes that can move more quickly. But then there are still those understandings about well, if that is the impact, then how is that managed? Ian has much more detailed knowledge of what we already know in that area and where we are at.

Mr LANCASTER: We do have quite a lot of monitoring. I would like to start to say that the Darwin rural area, which we essentially consider to be Litchfield Shire, is a plethora. There are aquifers all over the place. They are very complicated, overlying, intersecting with each other. Some, like Berry Springs and Howard East, are limestone aquifers so they are high yielding, good agricultural potential. Others that are further out past Coolalinga are what we call the Wildman Siltstone, so it is literally siltstone or mudstone, so all you are getting is fractures and fissures through the hard rock. So you get very little water out of that and often the quality is not good; it is poor, in fact. So in those areas we are less concerned because there is not a high potential for a lot of water use or interference.

We have some good information showing that the groundwater levels in the Howard East, in fact in the area of McMinns Lagoon and the area where there is intensive use, are reducing each year. The graphs show that although it is filling up most years, as I mentioned earlier, what is happening is we have got a declining lower level so we are taking more and more water out each year. Our concern, and certainly the graph also shows that if we have a poor Wet, it doesn't actually fill, and our concern is if we get two or three poor Wets, we are going to see something happening lower and lower and people will start running out of water; the water level will go below the bottom of their bores. That is our major concern and why we want to get a plan in place.

We also undertook, with some Commonwealth funds, some voluntary bore metering. We had just under 100 people and I think the Member for Nelson was one of our volunteers – thank you very much!

Mr WOOD: They didn't have any money to give me a meter! They put the sign up saying 'meter going here' I said 'where is it?' and they said 'we ran out of money'. And all they said it didn't have enough flow.

Mr LANCASTER: Anyway, we got some good information, but that was to inform us on what people generally use on a rural block. And, of course, we got highly variable figures from quite low water use to what I would term extreme water use. But we did get some averages and we really wanted to get averages for different sized blocks in different areas, so that during the planning, we could make those estimates and potentially after planning, if it is not agreed by government, and I very much doubt if it would be, that just stock and domestic use, your average blockie is not licensed and metered, and I can't imaging that would happen, we can use these voluntary metering figures to help us manage the resource.

I would expect that the larger users, the commercial users will need to be licensed. Currently there are very few licences because that 15 litre a second applies to the Darwin Water Control District. So if you have got a mango farm and your bore is equipped or the pump is not able to produce 15 litres, which is quite a lot of water, you do not need a licence nor are we able to licence them. I would expect through the planning process that that exemption is reviewed and that will allow us to then licence the bigger commercial users and manage the resource more closely.

Madam CHAIR: Any more questions?

Mr CHANDLER: I just have one other question. In Estimates, I asked a specific question about the Mataranka situation and I won't go in to the detail, you will know far more about it than I do. The indication was that that was pretty much resolved. that has been resolved?

Madam CHAIR: The Water Allocation Plan for Mataranka - - -

Mr CHANDLER: Yes, but a specific licence.

Ms LEEDER: The answer to the question that I gave was that a decision on the licence application was expected shortly. That decision has been conveyed to the applicants.

Mr CHANDLER: Okay. Thank you.

Madam CHAIR: Has the Water Allocation Plan been done for the Mataranka region?

Ms LEEDER: No, it is not completed yet.

Mr WOOD: That is what I asked at the beginning.

Madam CHAIR: Yes, I just wanted to make sure we got that on record because if that is all part of that report. Did you ask that - - -

Mr WOOD: First question.

Madam CHAIR: Okay, sorry. I am a bit slow here; my brain has just caught up. Member for Nelson, lucky you told me.

Ms LEEDER: Madam Chair, I think I said earlier but I am happy to reiterate it now that we would anticipate having a Draft Water Allocation Plan for Mataranka before the end of this year that would then be put out for public comment.

Madam CHAIR: Thank you, Diana. There are probably more questions that we could ask and we are heading in to our report and if we have got any further questions, you would you be invited back as we are compiling our report.

Ms LEEDER: Feel quite free to invite us.

Madam CHAIR: Because I think water, if we look at water and the economic development opportunities with agriculture, horticulture, with our 20 Growth Towns, water, as I said, becomes an important resource. We will certainly be contacting you again. Thank you both very much, it was very informative.

Mr CHANDLER: Not a question for here, but in layman's terms when you talk about these aquifers, say Howard Springs, which fills up each year, we know that some people drill down 30 metres or 100 metres to put a bore in or whatever, how do you find out how big they are? Is it just through drilling or is it other methods that they use to find out how deep an aquifer is?

Mr LANCASTER: Certainly traditionally, the only method of assessing the size of the resource was drilling. More recently, we use aerial electromagnetic surveys.

Madam CHAIR: Is that replacing those fantastic water resource guys?

Mr LANCASTER: Absolutely not. You still have the ground crew [inaudible].

Mr CHANLDER: And through that technology, you would find perhaps areas that you didn't even think water existed before and other areas not as big as you had hoped?

Mr LANCASTER: We could, but it is expensive, of course, and we concentrate on areas of significance like the Howard East and certainly, interestingly, at the Ord they did that because it is a very good technique and it also picks up salinity. So it can tell you yes, it is flowing from the aircraft. So electromagnetic technique and we have now confirmed the boundary of the salt out at Lambells Lagoon using that technique so rather than just joining the dots, we now have a much better technique of doing that but we still need the ground troop; we still need to drill holes in the ground.

Madam CHAIR: Is the study still being done on that Mary River area?

Ms LEEDER: Yes.

The Committee adjourned
