This is George Lewkowicz for the Don Dunstan Foundation Don Dunstan History Project interviewing Mr John Shepherd. John was heavily involved in water resources planning and management in the Engineering & Water Supply Department in the 1970s. The date today is the 21st January 2010 and the location is in Adelaide.

John, thanks very much for doing this interview for the Foundation’s history project. Can you just talk a bit about yourself, so a listener to the interview or somebody reading the transcript has an idea of who you are, and then how you got into your job?

Yes, okay. I was one of the early Government cadets. In the period 1955 to 1965, the Government assisted a number of high school matriculants to do engineering degrees because the State was very short of engineering-qualified people to undertake infrastructure development. While studying engineering, I worked in the summer holidays for the E&WS Department and finished up working for them after graduation. I did a master’s degree after that. In doing so I think I was the first user of a computer in South Australia outside the Defence Department. Then I worked on design, particularly on dams, and some planning of dams, I became a bit upset about the lack of water resources management. The philosophy in the E&WS and the rest of government was that you follow demand rather than manage demand, and that you allow your resources to degrade rather than do anything about it.

Really?

So I complained like mad about that and finally left to join the national urban development organisation which was established by the McMahon Government in 1973. And in the ’73–4 period under the Whitlam Government, this became the Cities Commission. Back in South Australia, there was a change of regime at the E&WS Department. Keith Lewis came to be its head. He asked me to come back and do what I’d been shooting my mouth off about. So he established the Water Resources Branch and I became head of that.

What year was that, roughly?
1974.

**What was the work of that branch?**

That was to establish a regime for managing the water resources of the State, which had not been done.

So we first reformed the laws and policies regarding water resources management, and the *Water Resources Act* of 1976 was the first modern water resources legislation in Australia –

**In Australia, wow.**

– subsequently copied by the other States, and it’s been upgraded with many amendments and changes since.

**What were you following through on that? This was your idea, the *Water Resources Act*?**

It was a shared idea, but I’d have to say that Keith Lewis and the Minister, Des Corcoran, were strongest initiators and supporters of it. And the principles particularly were to work on water resource management in a cooperative team manner with all of the agencies and interests that could help; the principle being, too, that to manage individual water resources effectively, such as groundwater resources of the Northern Adelaide Plains that were in really serious strife at the time, you should involve in its management, the people who are using it or have a stake in it. You then have a much better chance of making sure that the resource is preserved for their grandchildren and for the community. These were the concepts underlying the establishment of the South Australian Water Resource Council, (a high-level consultative mechanism) and the Water Resources Management Committees. Eventually the legislation was upgraded to give the communities associated with these water resources much more autonomy and authority in actually managing them. So it followed the best principles of water resources management.

**Water resources mean what, what sort of variety?**

Freshwater, inland resources.
It included the Murray, the Murray–Darling Basin, the South Australian interests in the Murray–Darling, so I became Deputy Commissioner representing South Australia on the Murray-Darling Basin Commission. But there we were constrained by the then primitive regime of the Murray-Darling Basin Commission, which was just managing water with regard to a small amount of salt but not much else.

**Plus evaporation and you name it.**

That’s right, yes. In addition to the Murray-Darling there are other individual water resources such as the various groundwater units of the South–East, the Northern Adelaide Plains, and the Barossa Valley, and the surface water resources of the Mount Lofty Ranges. All of these needed separate attention. There was the flooding problem. We identified that the risks of damage and loss of life from flooding of the Torrens were absolutely enormous. We also identified that there wasn’t a proper planning process for the development of the metropolitan water supply system.

So, with the involvement of the Council and Keith Lewis and Des Corcoran, we established units which would deal individually with each one of them and bring them forward. The first group, under Jim Killick, was the Murray–Darling Basin Salinity team. This team planned and designed the Noora Salt Evaporation Basin and the Woolpunda Salt Interception Scheme, which were more or less firsts in the world and have become the model for the very successful salt management program of the Murray–Darling Basin.

The second group was the Metropolitan Adelaide Water Resources Planning team, led by Alan Herath, who has qualifications in both engineering and economics. Alan was very conscious of the need to have proper regard to what things cost and to provide signals that encourage water users to save water and to move the whole system in the right direction. That work was very innovative.

The third team was a team under the late Peter Manoel. Peter was in charge of the technical and scientific work on groundwater resources management. He developed
the first groundwater mathematical modelling package to help us understand what would happen to groundwater systems under various management options.

And the fourth unit was Hydrology and Floods under the late Ian Laing. He and his team did the work on the Torrens flooding, particularly, which led to the Torrens Flood Mitigation project and the Torrens Linear Park project. The designs of these two projects were integrated together, and they were constructed as one single very successful project.

Where have you got the reservoirs, what part of all of this are they, the major ones?

The reservoirs were included in the metropolitan water supply planning project. There were some modifications to Kangaroo Creek Reservoir as a result of the flood mitigation, but the majority of the planning work for those was undertaken under Alan Herath’s team.

How many years ahead are you looking on this sort of exercise?

That varies depending upon the issue. You need to look at, first of all, on growth rates and how far ahead it’s economic to plan to provide for growing water resources. It depends upon growth rates. If growth rates are high, then you will be putting in new units of supply at a much greater rate. But you would be doing your economic and environmental and social analysis for long periods of 30–50 years or more, but your steps of system upgrade might be anywhere from five years apart to 15 years apart, and that’s where the issue of demand management comes in as well. If it’s going up too steeply there’s a problem. You shouldn’t be just following demand.

And you’ll remember that we had a terrible rating system in which water didn’t really have a price.

Yes.

A water supply customer paid a lump sum based upon the valuation of the property, and then if he or she went over the allowance that that represented, only then was the customer presented with a disincentive to use water. Getting rid of that distorted and
inequitable rating system was an objective and that was achieved eventually as a result of that work.

And at a sort of more micro level, how did you relate to the Highways Department and the Planning and Development Department, because they would have been looking at the development of Adelaide as well and doing their forward planning?

Yes. We discovered that there was no single agreed population projection development, indicative planning. And so we enlisted Graham Hugo, Professor Hugo, who was doing innovative work on demography at the time and promoted amongst the government agencies the idea that we ought to base these projections on proper social policy and demography, to establish the population growth scenarios based on the expected range of migration, life expectancies, birth and death rates, and what are the changes as a result of the improving health conditions of the community. And we finished up with population projections that were quite a lot smaller than had been used in earlier planning work, including our own in the E&WS, one of which I did myself and subsequently realised was quite deficient as a result of lack of input of demographic expertise.

So until you’d commissioned Graham Hugo there wasn’t a lot of interaction with the university in respect to it.

No.

That’s interesting, yes.

That’s right, yes.

So the departments had been working in parallel spheres rather than getting together with some of the experts.

Yes, indeed. And in Highways it didn’t help a lot, either, because the Highways Department kept its planning work on road development secret even from its own Minister, as you’re aware.

Really?

So there was little coordination with them on planning scenarios.
And the Commissioner had this idea because it was a statutory body you could just about do anything?

Yes. And in fact one of the early moves under a subsequent Labor Government was that John Collins and I were asked to go and see the Commissioner of Highways and ask if he would be prepared to provide this information to the Government. Initially he declined. We reported that back via the head of Premier’s Department to the Premier. We were then asked to go back to the Commissioner. He, probably very wisely, provided the information.

Interesting, yes. And there was a body called the Urban Development Coordinating Committee that I recall in the ’70s.

Yes.

Did you come across that at all in your work?

Not personally, but it was involved particularly in trying to make sure that the agencies could undertake their construction without stepping on each other, that everything was done in the right order, that resource requirements were smoothed, and not made ridiculously expensive by unnecessary peaks in work requirements.

How did your work impact on the specific development directions of the metropolitan area, like new development was being thought of or the population projection and then, ‘We need to release some more land’? Did the Planning Department come back to E&WS and others to say, ‘Well, look, is this feasible given where we are with our infrastructure’?

Yes. There was a lot of that.

Yes, right.

For example, in the Southern Metropolitan extension there was a committee established to undertake preliminary land use planning of the Southern Vales region, all the way over to the coast, the idea being to say ‘What of this land is appropriate for urban development; what is prime land for wine grapes and almonds?’ – it was chaired by John Harris; I was a member. The conclusions of that committee in fact can still be seen today in the mode of development of everything south of Noarlunga.
That’s interesting. So it was very forward-thinking there.

Yes. That was a multi-agency committee and my side was the water resources input to that.

Right. And I recall a special study on – this is very long-range thinking – on water resources and the idea of icebergs was – – –.

That was Alan Herath’s project on Metropolitan Adelaide Water Resources Planning, the idea being to look widely at all of the options, don’t miss out one: desalination, icebergs, all sorts of things. And we costed out all of that. And it was very interesting to see, it was quite clear that we had a huge opportunity to actually avoid these expensive options and go through demand management, which is how it eventually took place.

Just explain ‘demand management’ again, is that through a pricing mechanism?

Yes – not only pricing, but the water pricing structure gave perverse signals to the community in those days. There are many people would call us up and say, ‘I refuse to economise on water. I’m going to run a hose down the gutter into the drain until I have used up my allowance, just in order to protest against this stupid system’, and government after government would refuse to change because they were afraid of the claims of those who would be adversely impacted by any change in pricing structure. Finally, we showed that people were so inflamed by the unfairness of this that they were happy to pay more for water if the pricing structure was fair.

Fair enough. And within your own department how did the relationships work? Who was the key driver, was it the water planning or the sewerage people or whatever else was going on in the department?

It was very interesting. There was a saying earlier, some years previously, by people outside like Stuart Hart, that the Water Supply Division of the E&WS dictates the size of Adelaide and the Sewerage Division dictates the shape.

Right, I see.
But, very interestingly, why is it? The Adelaide Plains are uniquely configured to make sewerage cheap. It’s easy digging, uniformly soil. It’s not like the Hawkesbury sandstone of Sydney, which is a horror, or the basalt of West Melbourne, and it’s not hilly; it all grades down towards Glenelg Sewage Treatment Plant and north of that towards Bolivar. And this was one reason why Adelaide was able to move ahead of everyone else with a sewerage system that really made life for the residents of Adelaide aesthetically a whole lot better than any other city – and I think in terms of the health risks of diarrhoea as well, not that we have any proof of that. Sewerage is traditionally twice as expensive as water supply, but not so in Adelaide, and that has been the key in making Adelaide’s development less expensive, and aesthetically better than most other Australian cities.

**Did you look at water quality as well? I’m sort of relating that to water filtration –**

Yes.

– **and the deals done with the Commonwealth Government, I think, on that one.**

That’s correct, yes. In fact, when I was in the Cities Commission I was a member of the group that worked on the national sewerage plan, so we developed a set of standards for sewerage to be used by all of the cities where the Federal Government was putting in large quantities of money to bring the other capital cities up to Adelaide’s standard. And they used Adelaide standards, by and large.

. So it was at that time that it was realised that the sediment content in Adelaide’s water was higher than in the water supplies of other Australian cities. Sediment tends to shield water from disinfection. So we needed to filter the water as it is withdrawn from the reservoirs and the River Murray. The federal funds that for other States were used for the national sewerage program went to South Australia, to assist the water filtration program, though not on a grant basis but on a soft loan basis,. But the water filtration program was worked by a separate division within the E&WS Department, Water and Sewage Treatment Division, from which Keith Lewis had come himself. During the construction of the metropolitan water filtration program
there were several cases of amoebic meningitis, caused by the amoeba *Naegleria fowleri* Several people in Port Augusta died: there were 12 deaths altogether. It was a doctor based at Port Augusta, Dr. Bob Couter, who actually discovered the cause of these infections.

**Really?**

Scientists of the E&WS State Water Laboratories, the University of Adelaide, the Royal Adelaide Hospital and CSIRO researched the biology of the amoeba to come to an understanding of mode of infection, how to detect the organism, and appropriate methods of disinfection. As a result of this outbreak it was very important to ensure that the water supplied into those major country pipelines was filtered. This would enable disinfection to take place properly. We also changed the mode of disinfection from chlorine to chloramine, which is a combination of ammonia and chlorine, to make sure that the disinfection was active 50 times longer in the pipe. And after the completion of this work, there were no further cases or deaths.

**And relationships with the Treasury, and you mentioned the Premier’s Department earlier: how did that work? Were they onside with your work?**

Yes. It was all very exciting work and you could see that each of these units were moving ahead. Often the work was at the scientific and technical frontier. It was exciting, and people were therefore dedicated to what they did and they could see it was helping. And, if you’re going to do that, you actually have to get the business of securing the money right, which meant that the financial management had to be reasonably good, too. For one thing, you had to be utterly straight with Treasury; and not everybody was, in other departments. But complete openness with Treasury was something that we maintained traditionally.

**Good.**

But there was a fault, of course, and that was that, like in the traditional Treasury system, all of the E&WS’s revenue went into Treasury coffers and what the
Department spent had no relationship to what it earned. One of the things that we did in the water resources and planning area was to plan a much more close relationship between the two. We introduced commercial principles of financial management in which the Department kept the revenue it generated but had to greatly reduce its expenditure in order to live within it. This was after Dunstan’s time.

But the foundations were being laid during his time.

**That’s good – and they would be aware of your planning work and cost–benefit analyses and things like that.**

Yes, that’s right.

**Interesting. And the private sector, where did that fit in? Was there some group you related to that would give you some feedback on where they were going?**

The private sector didn’t figure very largely because of the Labor Government’s traditions of undertaking construction using daily paid workforces employed by the infrastructure Departments. And, let’s face it, it wasn’t very efficient. In latter days when the workload went down and the Labor Government said, ‘You’re not allowed to put people off and we won’t think about retirement packages’, it was extraordinarily inefficient. You’d have a 50-man team doing a 10-man team’s work, for two or three years. It was very bad. But a proper involvement and respect of the private sector developed from then on, as we used contractors to do design work, for example.

**Were there any key people you related to, like some of their ideas about future developments and efficiencies and things?**

In the private sector?

Yes.

It was fairly clear that on the design side that there were design companies and engineering consultants whose work was efficient and frontier. Brian Stone, who
was actually an engineer from Western Australia, headed up an American consulting firm on water treatment. He and several of his staff came over on a contract and helped us out on the design of key water treatment plants. Consultants helped us out on small design contracts, and a lot of the water resources management investigations and analysis were contracted out as well. So, for example, when we were doing the economics of flood mitigation, we called in the valuers from Brisbane who’d actually done the valuation work of the damage caused by the big Brisbane floods just before that, which were the biggest in the history of Australia.

Yes.

And those guys showed us a lot about what had been learnt in the private sector.

Interesting. I've covered the areas I wanted to. Was there anything you wanted to add to our discussion on the ’70s?

Well, I would say one thing on the political side: that without good political leadership the huge progress in water resource management, including management of the Murray–Darling Basin, would not have happened. And the leadership was outstanding. Des Corcoran was the Minister in most of those years and he was ideally suited for that kind of work. He had terrific support and the leadership when he needed it from Don Dunstan. He and Dunstan were a team that were very complementary and you could not have asked for a better political environment than that.

Good. Thanks very much for that, John.

END OF INTERVIEW