

COMPLEMENTS OF ROB LEMON 30.03.02

The Infrastructure Road to Recovery

Great Water Projects

9. The Clarence Scheme



The Clarence Scheme was summarised in the *News Weekly*, July 12, 1997: "Several factors are now combining to make it feasible and economic to divert the seaward flowing waters of the upper Clarence, Nimboida and Macleay Rivers into the Murray Darling basin. The annual flow of water available is comparable to that of the Snowy Mountain diversions.

"The Clarence Project would enable the development of further irrigation along the Dumaresq and MacIntyre Rivers that form the border

between NSW and Qld. The Macleay project would involve the transmountain diversion into the Gwydir River in NSW."

The Clarence Scheme was elaborated by its designer, Prof. Lance Endersbee, in a speech to the CEC on November 23, 1997:

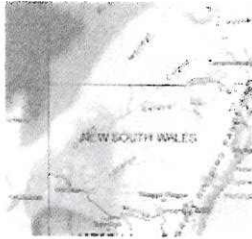
"There is the catchment of the Clarence River and it is a wonderful little cup in there and very steep country, high rainfall and one of the highest rainfall areas in Australia, and they get the summer rains from the monsoons coming down and

they get the winter rains as well. So there is a lot of rainfall there and it all flows out into the sea, and if you have been to Grafton, you know how wide the Clarence River is in Grafton. It's a big river. So I have worked out, designed a scheme for the diversion of the Clarence into the Darling.

"Now, as you know, there is a lot of algae in the Darling.... This would flush all the algae out of the Darling. I have designed this as a pump storage scheme. There is a surplus of thermal energy, coal fired thermal energy from the Hunter and

LaTrobe Valley and there is a surplus of thermal energy on the national grid and the national grid just goes right through there—past the project.... So I knew that there was a surplus of thermal energy overnight and at weekends and so with this Clarence diversion, rather than tunneling through the mountains, I could pump it up the hill and so I have devised a scheme whereby we pump overnight and at weekends, and we generate at peak times, on the way down the hill, and the project is economic!"

10. The Murray-Darling Basin



Prof. Endersbee: "There is an opportunity to greatly develop the existing Murray-Darling Basin, where they really only use effectively, something like 10% of the water that is applied to the land, deplorably low. So I've been saying, it is readily possible, to double the efficiency, which means we could double the area of land, with the same volume of water or even go further. I've just been in touch with the Chairman of the Common-

wealth Scientific and Industrial Research Organisation. He's told me that the new chief of that organisation is looking at the same possibility of doubling the output of food for the same volume of water in the basin. Now, once again, that is a project that initially might cost \$5 billion. The point is that the volume of output, at the present moment in the Murray-Darling basin, is about \$20 billion a year, if you add crops plus all the manu-

facturing based on food, and food products and things like that. The agriculture in the Murray-Darling basin, plus the processing is something about \$20 billion. [Prof. Endersbee has updated earlier estimates of \$16 billion.] Now we could go pretty close to doing that again. In other words, we could easily add another \$20 billion dollars, of output, for the same volume of water. So, if that is the potential value per annum, that means

we could easily justify a capital cost, of \$5 billion to start, then we go, and get on with it.... However, the private sector is unlikely to embark on the complete design and construction of entirely new irrigation systems. This would involve new diversion weirs, pumping plants, new lined channels totaling hundreds of kilometres, pipe distribution systems, and the opening up of vast new lands for irrigated agriculture...."

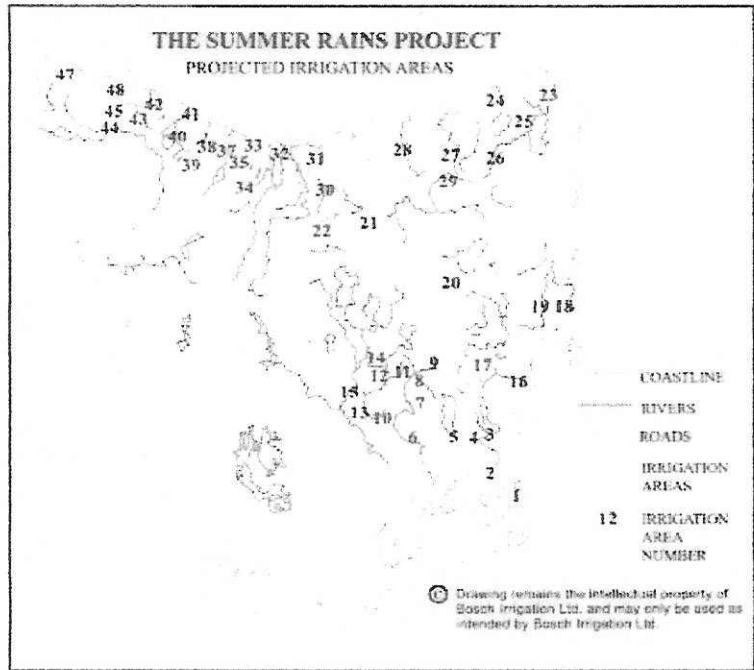
11. Tasmania



deed running short of power today.

In other uses of water, the state government released its "Water Development Plan for Tasmania" in August 2001, which includes the following projects, some of which have been long-planned: new irrigation in the Meander region by building the Meander Dam; increased irrigation in the South East; irrigation in the Clyde, Derwent and Jordan catchments by transporting water from the Great Lake/Arthurs Lake area; increased irrigation in the Circular Head Region in the North West; the Waterhouse project in the North East; the Long Marsh Dam project in the northern Midlands; increased irrigation supplies for the South Esk basin; increased urban and irrigation supplies on the East Coast; and water for irrigation from the Wesley Vale pipeline.

On a more inspiring scale, Bosch Engineering Pty. Ltd. in 1998 drafted the Summer Rains Project, which identified the possibility of storing 300,000 megalitres of water to irrigate some 60,000 hectares in 50 different projects, which would increase the state's presently irrigated 45,400 hectares of 132%! By 2001, Summer Rains Project proponents had identified over 1,000,000 megalitres of water storage, including the large-scale Waterhouse proposal in the North East with a capacity of 113,000 megalitres, which is now subject to state and federal feasibility studies, but which has no guarantee of proceeding, given the "privatised" assumptions under which it is being reviewed.



The Summer Rains Project has identified a million megalitres to irrigate major sections of Tasmania.

12, 13. Melbourne

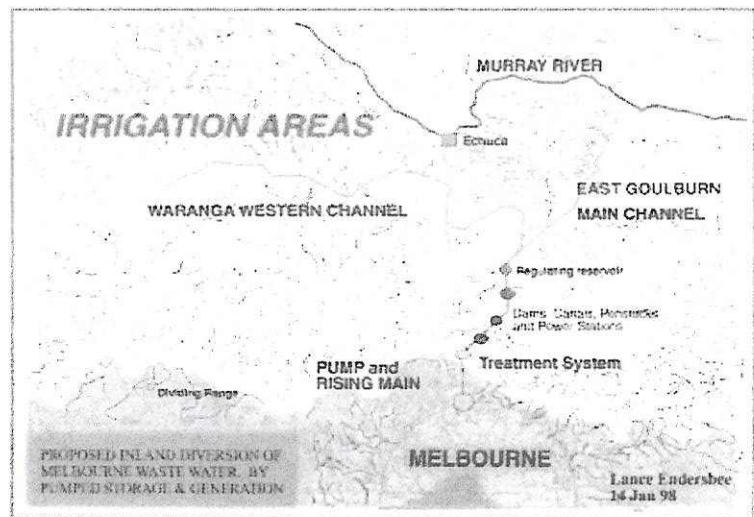
Nuclear-desalinated seawater would solve Melbourne's water shortages for the indefinite future.

Some of Melbourne's treated waste and stormwater could be used either in Melbourne itself, or in Prof. Endersbee's plan to use it, as summarised in the *Sunday Herald Sun* of August 9, 1998: "A bold plan to send Melbourne's waste water inland could help prevent drought in large parts of southern Australia and pay for itself by generating power and by selling water to farmers, says a leading Australian engineer. The massive infrastructure project would make use of some of the hundreds of billions of litres of Melbourne waste water and stormwater which empties into Port Phillip Bay and Bass Strait every day. A plan by emeritus professor Lance Endersbee involves construction of a pipeline starting 25 km north of the centre of Melbourne and a pumping system to lift the water over

the Great Dividing Range [which is near the outskirts of Melbourne] and into river systems to the west. It would be one of the nation's largest infrastructure projects, involving the construction of massive pumping stations and hydro-electricity generating plants and could cost \$2 billion."

The project is similar in concept to the proposed Clarence diversion, and uses overnight pumped storage and peak generation to keep power charges to a minimum.

Recently, Melbourne Water has proposed to pipe and re-use some of Melbourne's vast waste-water run-off to irrigate large areas west of Melbourne, from Werribee to the Yan Yean mountains.



Prof. Endersbee's plan involves construction of a pipeline starting 25 km north of the centre of Melbourne and a pumping system to lift the water over the Great Dividing Range [which is near the outskirts of Melbourne] and into river systems to the west.

PAPER to

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Queensland Division

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**NATIONAL INFRASTRUCTURE
AND
NATIONAL DEVELOPMENT**

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SUMMARY: *Large public infrastructure projects require long lead times and confident governments. It is 50 years since the start of the most recent major national development project, the Snowy Mountains Scheme. A number of important and feasible infrastructure projects now require attention. They are not make-work schemes. These projects would bring enormous national benefits, orienting Australia to the growing markets of the world. We need courage and economic foresight and the constructive cooperation of our governments if we are to grasp these opportunities.*

Feasibility of Asian Express

An example of the relative cost advantages from the viewpoint of a farmer or manufacturer who is shipping 'time sensitive' cargo to China is shown in Figure 8

Such analyses show that it is much more economic for a shipper to pay a premium on freight costs for fast rail and fast ship in order to gain a substantial overall saving in time and money.

Similar savings are indicated for shipping via Darwin to ports throughout southeast Asia, Taiwan, and Korea. Darwin is also an attractive port for fast freight services to Japan, and to connect with fast shipping services to Europe via southeast Asia.

Project implementation

Under present arrangements, the Asian Express project would require legislative approval by the Australian government, and four state and territory governments.

It is helpful to remember that in the decade of the 1880's Australians were completing 1,000 km of railway line each year or 100 km per month over many months. At that rate the project could be completed in 4 years. But these days we do not have enough horses and drays !

The Asian Express is feasible, and at \$4.6 billion for single track is readily achievable on a fast schedule. The project is seriously needed as the basis for continued national development. The next task is for the governments involved to seek formal proposals from the private sector. The project should have legislated exemption from any claims under Native Title

PROJECT No. 2 The Clarence river transmountain diversion

Several factors are now combining to make it feasible and economic to divert the seaward flowing waters of the upper Clarence, Nimboida and Macleay Rivers into the Murray-Darling Basin. The annual flow of water available is comparable to that of the Snowy Mountains diversions

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The operations to date of the national electricity grid in Victoria and NSW have indicated a need for additional pumped storage capacity to optimise the operation of the base load thermal stations. There is likely to be a greater need when the Queensland thermal stations join the national grid. The nature of the load curves on the integrated system are such that there is an overnight and weekend surplus of thermal capacity which could be used as cheap energy for pumping

It is anticipated that the private thermal power station operators could be interested in participating in these pumped storage schemes as a way of optimising the operation of their thermal power plants

It is my preliminary assessment that the Clarence project would be quite feasible, and possibly with strong economic justification. The Asian Express project would radically change the access to markets for irrigated produce, thereby increasing the value of water in the irrigation areas.

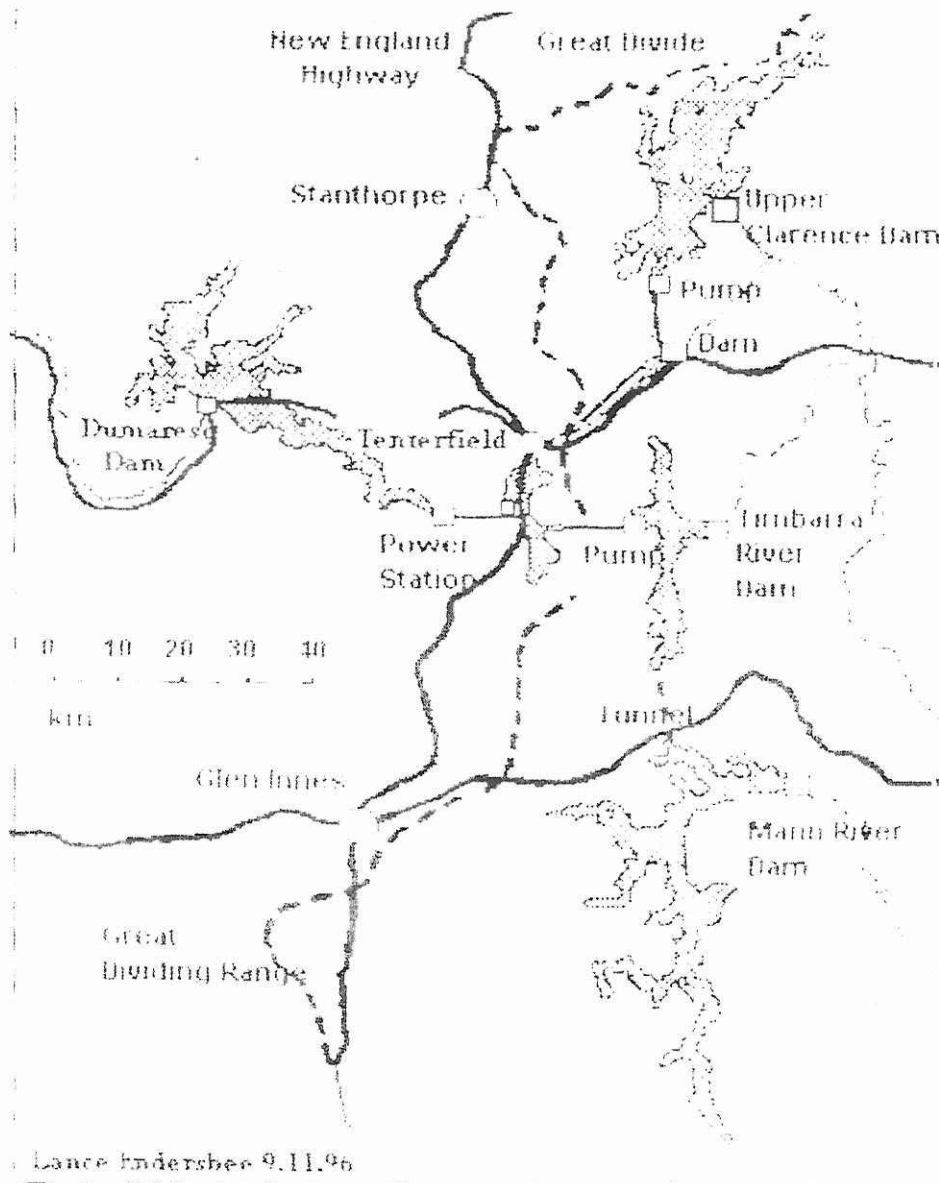


Figure 9 Indicative arrangement for the inland diversion of the upper Clarence, Timbarra and Mann rivers into Dumaresq river.

The project involves pumping the coastal waters up to a headpond on the Great Divide plateau near Tenterfield, and the generation of power on the inland side in the fall to a large regulating reservoir and power station on the Dumaresq River. The Mann River dam and the Timbarra dam are to be connected by an equalising tunnel. The other diversions may be surface pipelines. Design and construction could be completed well within 10 years. The project would operate as a pumped storage system, reducing overall costs of coal fired thermal generation in Qld, NSW, and Victoria.