Carrathool Shire Council

NOTE
ALL COMMUNICATIONS MUST BE ADDRESSED TO THE GENERAL MANAGER.

IN YOUR REPLY PLEASE QUOTE REF.:

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24th June 1999

Mr Herb Plunkett
Assistant Commissioner
Productivity Commission
PO Box 80
BELCONNEN ACT 2616

FAX NO: 02 6240 3311

Dear Mr Plunkett

INQUIRY INTO IMPACT OF COMPETITION POLICY REFORMS ON RURAL AND REGIONAL AUSTRALIA

In response to your notification of the 16th June 1999 (No. CPRR C7) Council welcomes the opportunity to make this submission to the Inquiry.

Please note that Council's registration to appear before the Public Hearing to be held at Albury on the 1st July 1999 was forwarded by the Hon. E F Bridge MLA on the 8th June 1999.

In the first instance Council registers its concern that the Commission is able make a comment to the effect that there is a "perception" that National Competition Policy is bad for the inland of Australia.

In reality there is no "perception" but rather "factual" evidence that National Competition Policy is disastrous for the engine room of this great Nation, rural and regional Australia.

National Competition Policy spells only doom and gloom to the inland of Australia which will ultimately lead to the demise of the Nation as it is regional and rural Australia that provides production for domestic and export consumption, the latter being critical to Australia's balance of payments.

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Council's concerns are amplified in the following areas.

Public Infrastructure Funding

The very principal of NCP requires full cost recovery on all future public infrastructure development. This in effect will prevent further public investment in infrastructure that is essential to the Nation meeting its potential to become a food producer for the world.

There is no doubt that the future of Australia will very much depend upon its capacity to achieve food production levels necessary to satisfy the growing demand of Asia. Australia has already demonstrated its capacity to produce substantial food commodities for export markets. For example the Murray Darling Basin produces 60% of Australia's agricultural production.

Given the acceleration of world population the demand for food is increasing at a dramatic rate and Australia will not realise its full potential unless Australian Governments in partnership with the private sector invest in infrastructure essential to realising the Nation's full potential.

The capacity of the Murray Darling Basin is very much attributed to Government decision to invest in and develop the famous Snowy Mountain Scheme which pays for itself every two years! Like the Snowy Scheme the Ord River Scheme pays for itself once in every nine years!

Water is the single most important ingredient in the future of Australia and the Snowy and Ord Schemes serve notice to us all that further infrastructure investment in water is essential to the Nation achieving its production potential. We simply cannot allow NCP to prevent Government in partnership with private sector investing in water diversion schemes. Further, Government must become the saviour of the Great Artesian Basin and accelerate beyond present comprehension its investment program to insure its long term viability.

The value of the Great Artesian Basin is clearly spelt out in the attached paper from Professor Lance Endersbee. Professor Endersbee has determined that the wastage from the Great Artesian Basin equates to $13.8 billion of production annually. The cost to fix the problem is trivial and it must indeed be scandalous that this precious resource is not protected immediately. Professor Endersbee expects that we will lose the GAB in the next 40 years if strong Government action and investment is not made immediately.

To date the capacity for Australia to reach its production potential has been significantly disadvantaged by an ineffective and inefficient rail network. The break of gauge between the States has done nothing to enhance Australia's opportunity to become an efficient world food producer. Government needs to invest in the revitalisation of rail systems and infrastructure able to be linked to projects such as the proposed Melbourne - Darwin railway.

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National Competition Policy cannot be tolerated and allowed to stand in the way of Australia reaching its wealth potential.

Rice Industry

The most successful cooperative in the history of Australia has been the Ricegrowers Cooperative Limited stationed at Leeton, NSW. 93% of Australia's rice production occurs in the Murrumbidgee and Murray Valleys within the State of NSW which provides an enormous export benefit to Australia.

National Competition Policy has threatened this industry and the NSW Government by suggesting that the NSW Government will be docked $10 million annually if the NSW Government does not remove the vesting arrangements in the rice market.

The question is quite simple. Why is National Competition Policy threatening the viability of the rice industry and its producers within the Murray and Murrumbidgee Valleys when in fact this industry alone stands as the model example of how to become a successful cooperative and producer for the wealth of Australia!

Dairy Industry

Council draws the Commission's attention to the dairy industry where dairy farmers achieved no monetary gain for their product whilst the large wholesalers reaped substantial financial benefit all at the expense of a higher commodity price to the consumer.

Electricity Industry

Another example of the adverse impact of NCP has been the restructuring of the electricity industry which now provides tariff reduction to major industry at the expense of the smaller consumer including small business through increased electricity charges.

Council's area prior to the restructuring of the electricity industry was serviced by Murrumbidgee Electricity which provided the most competitive tariff charges in NSW whilst at the same time delivering a service standard that has deteriorated substantially since restructuring. Restructuring has also seen loss of jobs to rural and regional NSW.

Cross Subsidisation

Under the principles of NCP and the rules appertaining to cross subsidisation the potential for rural and regional consumers to pay exorbitant additional charges for telecommunication and electricity charges is a real threat.

When one considers the per capita value of production between metropolitan and rural/regional populations it is farcical to suggest that cross subsidisation should be removed.

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Conclusion

The fact of the matter is clearly that National Competition Policy is detrimental to the short, medium and long term of rural and regional Australia and unless it is dismantled and abandoned the existence and quality of life of rural and regional Australia will be lost with Australian Governments confronted with a burden that will send this Nation to the depths of "banana republicanism". Australia will never be able to afford the social welfare implications of National Competition Policy.

Council thanks the Commission for the opportunity to make this submission and urges the Commission to take heed of the damage that NCP is already causing to the production sector of Australia.

Yours faithfully

LINDSAY THOMAS
GENERAL MANAGER

Encl.

Emeritus Professor ***LANCE ENDERSBEE***
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24 June 1999

Mr. John Secombe,
Chairman,
Great Artesian Basin Consultative Council,
P.O.Box 2477,
Fortitude Valley, BC 4006 Queensland.

Dear John,

Great Artesian Basin

As you know I was present at your presentation on the Great Artesian Basin to the Federal Inland Development Organisation in Charleville on the 18th June. I later advised you that my understanding of the characteristic behaviour of the strata at aquifer level was somewhat different to the description you included in your address. I have noted that the interpretation you presented forms the basis for policy decisions by the five governments involved, and is included in some of the annual reports and publicity material.

After further investigations, I believe that there has been a very serious error in the understanding of the physical properties and behaviour of the aquifers of the Great Artesian Basin. It is evident that this error has contributed to the present high level of waste of water in the Basin, which I think is quite reckless, irresponsible

Perhaps I should let you know about the background and justification for my views.

From 1950 to 1975 I was active in the planning, design and construction of hydro-electric power stations, dams and tunnels in Australia and other parts of the world.

One major specialisation was in the science and engineering of rocks and rock masses, and the application of this knowledge to dam foundations, pressure tunnels and underground power stations.

I had the opportunity to travel and inspect comparable works in Australia and overseas, and to present papers at international conferences. I was an international Vice President of the leading learned body in the discipline, the International Society of Rock Mechanics. A short CV is appended.

I have had particular experience with the Permian and Triassic series of sedimentary rocks in Australia, and have observed their characteristic properties and behaviour in deep underground excavations.

With that background I offer the accompanying short comments, primarily to advise you of my strongly differing interpretation of the data you presented.

I realise that my remarks may come as a surprise, and stand ready to assist in the understanding of the issues I have raised.

You have my permission to send a copy of this letter and report to your colleagues on the GAB Consultative Council, and to the responsible officers at state and national levels.

At the weekend I mentioned my concerns to Charles Allen, Chairman of CSIRO, and will send him a copy for information.

I may publish the essence of my views later on in FOCUS, the magazine of the Academy of Engineering and Technological Sciences.

Yours sincerely,

Lance Endersbee

THE GREAT ARTESIAN BASIN OF AUSTRALIA

A COMMENT ON THE PROPERTIES OF THE AQUIFER AND THE POTENTIAL LIFE OF THE RESOURCE

Lance Endersbee

24 June, 1999.

The following comments and report were stimulated by a presentation on 18 June 1999 by Mr John Secombe, Chairman of the Great Artesian Basin Consultative Council. The presentation was to a meeting of the Federal Inland Development Organisation, held in Charleville.

At that presentation I discovered that my understanding of the characteristic behaviour of the sediments and the aquifers of the Great Artesian Basin was substantially different to the interpretation presented by Mr. Secombe, and which forms the basis of present government policies for the management of the resource.

In the following pages I present my reasons for my opinion that:

(a) The present interpretation of the characteristics of the aquifer is incorrect.

(b) The assessment of potential life of the groundwater resource is wrong and hopelessly optimistic,

(c) Substantial and permanent damage is being done to the aquifer by the present uncontrolled usage.

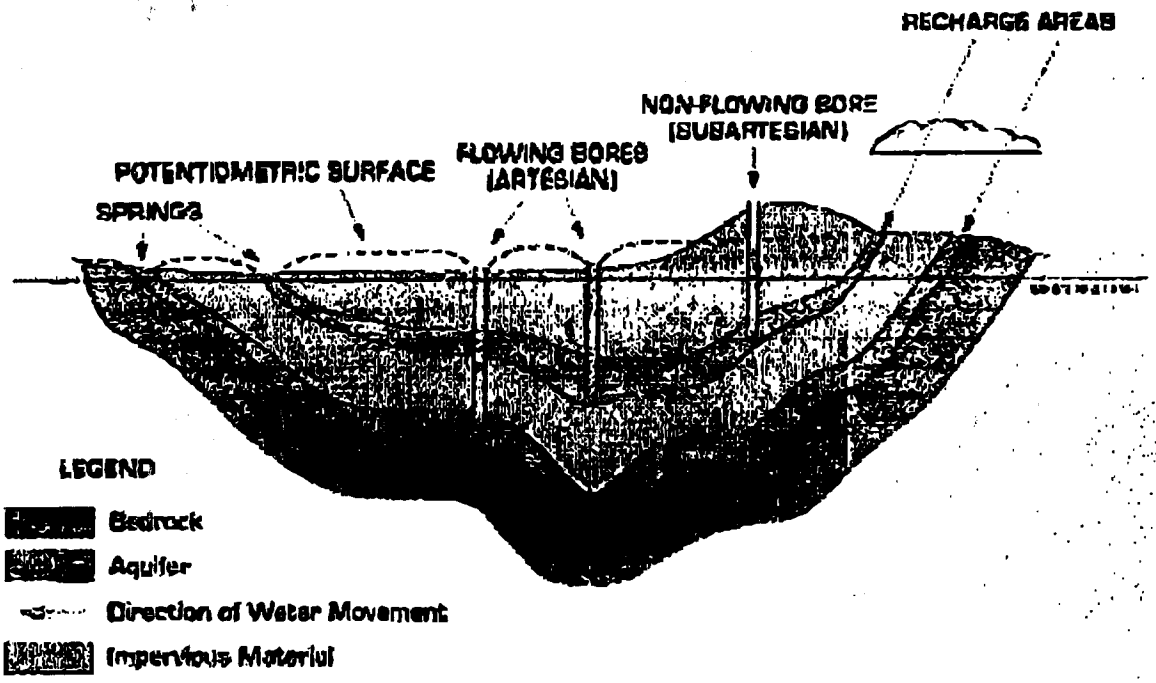
(d) The economic cost to the nation of the present bad practices is so horrendous that the costs of immediate correction are quite trivial by comparison. That is, in a matter such as this, there can be no question of insufficient funds.

Reasons follow:

1. Open System vs. Closed System

The present conceptual model of the characteristic behaviour of the Great Artesian Basin is that of an open system.

This conceptual model is shown in the Queensland government web page - www.dnr.qld.gov.au/resourcenet/water/artesian_basin/flow.html. The accompanying illustration is taken from that webpage



OPERATION OF AN ARTESIAN BASIN

The concept of an open system assumes that as water is withdrawn from the aquifer it can be replaced by lateral transfer from recharge areas or from elsewhere in the basin.

Unfortunately, because of the huge lateral extent of the GAB, which covers 1.7 million square kilometres, there are virtually no prospects whatsoever for lateral transfer from recharge areas.

It is also assumed that the withdrawal of water causes no change in the physical dimensions or characteristics of the aquifer.

The present interpretation is based on the assumption that the Jurassic sandstones are porous, and that their porosity is unchanged by the discharge of water from the basin, or by the drop in water pressure. The flow of groundwater through the aquifer is considered to correspond to that of flow through porous media. This interpretation suits the open fluvioglacial aquifers in North America, which are radically different to our Jurassic sandstones.

These related assumptions are implicit in the description of the operation of the Great Artesian Basin shown in various reports. The concept is shown quite dramatically in the above figure.

The diagram above reflects the present views on the operation of the Basin, and is repeated in many reports and publicity documents. It is included in information that is available to Education Departments and schools.

It is my opinion that the diagram above is grossly misleading. It creates false expectations about the potential and sustainability of the Basin. It may be almost acceptable as an explanation to young children in schools, but it is certainly not acceptable as a basis for government decisions on management of the Basin.

The water that is now in the basin is all that will ever be available. It is a closed system. That has several implications.

2. Porous Sandstone vs Jointed Rock Mass

When the Great Artesian Basin was first penetrated by bores, the water gushed out at high pressures and high discharges, the fountains extending 100 feet and more into the air.

That is certainly not the result of seepage through porous sandstones into a borehole, but the release of high pressure water stored in open fissures in the rock. The porosity of the sandstone rock is not a factor.

The proper understanding of the operation of the aquifer is that of an open jointed rock mass.

The water pressures in the aquifer a century ago, prior to exploitation of the GAB, were almost comparable to the overburden pressure of the rocks.

The original formation of the aquifer should be seen as the consequence of the effects of high hydraulic pressures in rock fissures, effectively jacking the rock apart. In this case, the extra-ordinary continuity of the sedimentary basin enabled these water pressures to open up fissures in the sandstone over great distances

The differences in the mechanical properties of the sandstones and the adjacent mudstones are also a major factor. Crustal disturbances in geological time would have created far more fractures in the sandstones than in the more pliable mudstones. It is quite normal in coal mines in similar rocks to these in Australia to find water-bearing, open jointed sandstones confined between unjointed mudstones.

3. The Effect of Withdrawal of Water through Boreholes.

Let us first state the overall physical conditions. We are dealing with saturated, incompressible rocks, and incompressible water in fissures and bedding planes. It is a closed system.

In physical terms, the effect of withdrawal of water is a reduction of the overall volume of the aquifer by an amount equal to the volume of water removed. The ground surface subsides by an amount equal to the volume of water removed.

Because it is a closed system, the removal of water is accompanied by a reduction in the water space in the fissure openings in the rock. The fissures close. The water pressure is reduced, the pressure on the rocks is less, and the rocks expand into the fissure openings. There is a reduction in discharge capacity of the aquifer.

4. Plasticity of the Rocks

A characteristic feature of these rocks is their plasticity and capacity to flow under shear stresses. At depth, these rocks do not normally have open joints or fissures, as the rock itself simply flows or changes shape to close the openings. The rocks may have fractures, but not open joints. Open joints and fissures may be evident in near surface rocks, but not normally at depth.

In the Great Artesian Basin there are fissures in the sandstones in the aquifer. These open fissures were originally formed as closed fractures during crustal movements, and then opened and sustained by the high water pressure in the aquifer. Over geological time there was a hydraulic jacking effect, which effectively opened up the strata over vast distances.

5. Effect of Reduction of Pressure

The effect of a reduction in aquifer water pressure is quite catastrophic.

The open fissures close as the rocks respond to the effect of the lower water pressures and the driving force of the weight of the overlying sediments. There is a loss in potential energy as the overlying rock mass subsides.

It is definite and slow change. For all practical purposes it is quite irreversible, as the matter can only be corrected by applying water injection pressures sufficient to carry much of the weight of the overburden over a long period of time.

In effect, the depressuring of the aquifer has resulted in a huge loss in potential energy, and that energy, and more, has to be re-applied to reverse the process.

The pressure drop since the first development of the GAB is assessed at up to 100 metres of water pressure head.

It is inevitable that the closure of fissures arising from that loss of pressure is still occurring, and that we may expect continuing closure for some time. It is much worse if boreholes are permitted to flow freely, as that accelerates the process. The immediate capping of all open bores is absolutely vital if we are to have any prospect of retaining the GAB at anywhere near present levels of useful output.

6. Dry Bores

It should be recognised that the dry bores represent the end phase in the permanent destruction of the aquifer. There is little possibility of using pumping to lift water from a dry bore, as the lowering of the water pressure at the pump intake would lead to final closure of the fissures.

The dry bores appear to be aggregated in certain areas. These areas now form a break in the continuity of the aquifer.

7. Magnitude of the Resource

It is stated in the web page "Great Artesian Basin Facts" that the estimated total water storage is 8,700 million megalitres. I am not aware how that figure was assessed. However, I sense that the figure may be seriously in error, over-estimating the resource by at least an order of magnitude and possibly much more.

A new assessment, using present data on trends in pressures and flow rates should be undertaken.

8. Value of the Resource

The present groundwater flow from the Great Artesian Basin supports a level of production of $3.5 billion per annum, according to a press release.

The current artesian bore discharge is 1250 megalitres per day. It is estimated that 80 per cent of the current outflow is wasted because of inefficient delivery systems. Thus, the useful part of the outflow is 20% of 1250 which is 250 megalitres/day, or 91,250 megalitres/annum.

Thus the water enables and supports a level of total economic activity equal to $38,000 for each megalitre of water that is actually used efficiently.

But 80% is wasted. With a level of wasted water of 80%, or 1000 megalitres per day, or 365,000 megalitres per annum, the annual loss in potential future production is $38,000 x 365x1000

This wastage equals a loss of $13.87 billion each year in future production, or $38 million each day! With these incredible numbers, it really does not matter how we assess present value of future lost production, it will be very big.

This waste is of truly enormous proportions and should be corrected immediately. In all these circumstances, the costs of immediate action are quite trivial in relation to the colossal damage that is occurring as each day passes.

9. Management of Actions

Because the artesian basin covers four states, and because the actions required have very serious implications for the national economy, I think the best approach is to put together a national action team, which could be created by seconding officers from the states involved. A set of standard designs is required for rapid production of new wellheads with water control, video transmission and monitoring facilities A reasonable objective could be to correct all waste within 2 years. The Army could assist, especially the Army Engineers and the Helicopter units.

Lance Endersbee 24 June 1999