Submission to the Remote and Regional Affairs Committee on Water Policy Initiatives.

Prepared by

Ian Marshall

Contact Details

Address **69 Leonora Street Como WA 6152**

Phone **(08) 93133590**

Date **13th December 2005**

Table of Contents

EXECUTIVE OVERVIEW.

The following paper is a submission directed to the Senate inquiry into Water Policy Initiatives. Specifically this paper seeks to address the issues specific to the Terms of Reference of the inquiry, viz.

> *The impact on rural water usage of recent water policy initiatives and the possible role for Commonwealth agencies, with particular reference to:*
> *a) The development of water property titles;*
> *b) Methods of protection for rivers and aquifers;*
> *c) Farming innovation*
> *d) Monitoring drought and predicting farm demand (for water); and;*
> *e) The implications for agriculture of predicting changes in patterns of precipitation and temperature.*

This submission to the inquiry will focus on the terms of reference points a) to c).

Essentially the points that I wish to make to the Senate inquiry are;

- That trading in water allocations while a very worth while endevour will only be viable if water supply over the entire continent can be guaranteed;
- Should trading of water allocations be developed the natural flow of water will be away from rural regions to metropolitan or non irrigation users as these groups have a greater capacity to pay;
- That excessive ground water extraction will only create further environmental damage to both rivers and aquifers; and;
- That water allocations for irrigations should be priced to the end users based on a productivity formula rather than as simple "all cases" model. This will allow a fully functional free market to price water which ill result in a better economic use of the product.

This submission also is seeking support for the costing study required to commence the commercialisation of a water delivery system that I have been developing. This concept is briefly described below.

Back Ground information.

Over the past 30 months I have been developing and structuring a concept that would see water transported from the North West of Australia to the Eastern States. In summary the project will have the following key components and costings;

- The project would be national in scope and the delivered cost of the water would not exceed twenty-six cents (26 cents) per kiloliter throughout the delivery system, ie nationally.
- A total of 6,500,000 megeletre (ML) water rights would be available and this water will be delivered to all water right holders at a rate expected to be in the range of 150,000 to 250,000 litres per hour, per outlet.
- The delivery system would incorporate the capacity to remove and recycle salt affected water from agricultural regions along the pipe's general route. This recovered water should, over time, amount for up to 45% of the total water entering the system. This would allow for the reclaiming of saline affected agricultural lands for which there is no national capacity to address.
- Generally the system would be environmentally "low impact" visually and target having a zero carbon generation of the delivery system once completed. The proposal would provide each water right holder with approximately one tonne of carbon offset credits per year.
- That the owners of land over which the delivery system is constructed are compensated adequately over the entire length of the project and in proportion to the volume of water that traverse each segment.
- That the project be developed as multi utility, ie a national delivery system for water and possess the planned capacity to carry both natural gas and electricity.

- The full cost of developing the infrastructure project, estimated at $85 billion would be fully funded by the sale of water rights to water users.
- On completion the water delivery infrastructure project will be managed and operated by the water right holders through a specific legal entity.

The aim of the infrastructure project is to create an "out of the square" solution to our developing water scenario. The overall scarcity of water will over the next 25 years become critical.

This is especially the case in relation to the supply and distribution of water into rural regions and rural communities. Currently over 60% of Australia total water use is in irrigation and as supply declines the overall effect on our economy, especially in the area of exports will be significant.

At this point an application is pending with the National Water Initiative group for funding to undertake an in-depth costing study of this project. The costing study is essential to determine the overall cost and structure of the Individual Water Rights to be sold to commercialise the project. The concept is in the Commercial and In Confidence phase and is not available for general viewing. A summary of the concept is available on request subject to the Commercial and in Confidence provision.

I do not believe that this submission is the correct platform to fully detail the concept and or its mechanics. It is important to the submission to be aware that a suggestion is however on the table that could have the effect of significantly reducing our dependence on traditional sources of water, and which would allow for meaningful trading of water within the entire land mass of Australia, subject to the route of the delivery system.

The concept presented is a proposal to be fully funded from the sale of Individual Water Rights that will see irrigators and investors purchase 6,500,000 Individual Water Rights for a cost of $250.00 per year. The total cost of an Individual Water Right (one ML) is estimated at this stage to be $13,750. This will guarantee the owner to receive a ML of water per year for the next 55 years. In developing this concept a key, if not essential, issue is the capacity for the owners of the Individual Water Rights to trade their water as either a bundled or unbundled commodity. Essentially they must have the capacity to;

- Trade the Individual Water Rights "bundled";
- Trade the water within the Individual Water Rights "unbundled"; or;
- A combination of both.

This structure will see water delivered to Individual Water Rights holders on the delivery system that will cover roughly 8,500 km, of which 15% to 18% will be in regions suited to irrigation. This distribution will have the overall opportunity/capacity to offer roughly 100,000 square kms to irrigation and not have geographic restrictions.

The system will have the capacity to deliver water into Perth, Adelaide, Melbourne, Sydney and Brisbane water supplies and have access to approximately 35% to 45% of Australia's mining regions.

As I view the present position the capacity to trade either existing water allocations or those proposed by the concept will require a trading structure which will both complement and add value to all water users and to the economy generally. These trading capacities will be particularly beneficial to water users within rural areas that at this point have little assurances that over time their water allocations will be available

In the marketing analysis undertaken it is assumed that current holders' of water allocations for irrigation are unlikely to be the initial target market. The target market for water rights will be;

- Farming operations on the route of the delivery system that view a potential commercial gain in a regular and reliable water right; and;
- Investors both domestic and overseas that view a potential commercial gain in owning the Individual Water Rights.

In both cases the option or capacity to trade in to or out of their positions in Individual Water Rights is essential.

The delivery system proposed would have the capacity to simply transport water for additional water allocation holders on the assumption that water quality was adequate.

THE DEVELOPMENT OF WATER PROPERTY RIGHTS;
(Terms of Reference point a).)

The National Water Initiative guide lines, and the enabling legislation and inter government agreements have indicated that they endorse the capacity for the capacity to trade in water. Specifically they state that;

> *Creating an effective legal structure for the Individual Water Rights that would allow for the following;*
>
> - *Specify the essential characteristics of the water products;*
> - *Be exclusive;*
> - *Be able to be traded, given, bequeathed or leased;*
> - *Be able to be subdivided or amalgamated;*
> - *Be mortgageable (and in this respect have similar status as freehold land when used as collateral for accessing finance); and;*
> - *Be enforceable and enforced.*

This structure in my view is an essential development in the method that water for irrigation is allocated and utilised in Australia. This view is one shared by both ABARE and the Murray-Darling Commission. The Murray-Darling Commission makes the point in their published submission to this inquiry that trade in annual allocations reveals the opportunity cost of water. Irrigators now have the opportunity to trade their annual allotments when expected return from the trade, plus alternate land uses, exceeds the expected benefits of their continued use of water within the balance of the water year (subject to any carry over provisions that exist.

ABARE appear to endorse the concept of tradeable water allocations however it is difficult to determine from their submission (it this committee) if they endorse these in “bundled’ or “unbundled” “explicit” or “implicit” form.

This submission contends that while the concept of tradeable water allocations is highly desirable the major issue will be the source of water from which the allocations will be made and the capacity to supply these allocations.

The irrigation supply chain has two major flaws,

- The leakage and loses within the distribution structure within major irrigation networks; and;
- The reliability of supply into these networks.

The (published) ABARE submission to this inquiry seeks to examine methods that would allow for more appropriate delivery mechanisms for down steam users however the basic issue is that the trading of something that cannot be supplied is eventually going to occur.

In a recently published research paper on the effects of Climate Change the Allen Consulting Group made some relatively significant predictions as to the levels of available water for irrigation. Effectively they feel that available water (derived essentially from rainfall) will be reduced by as much as 25% by the year 2030. This will mean that effectively 7,000 GL will be unavailable for irrigation by that date unless new or additional sources of water are found to replace the short fall.

In Australia currently 25,000 GL of water is used annually for all purposes. (2004 FY figures) Over 60% of this water is used for irrigation (15,000 GL) of which roughly 12,000 GL is supplied into the Murray-Darling. As water becomes increasingly scarce then supply will be diverted from irrigation use to metropolitan consumption. This will have a very significant effect on many rural communities and rural industry.

Competition for water will also be further constricted from the legitimate demands of environmental river flows, which could absorb very significant quantities of available water. The resulting problem

will be that while allocations of water to individual irrigators exist they may not have the capacity to be guaranteed which will make the overall trading in the allocations extremely difficult regardless of the overall benefits to the irrigators.

To have any sort of trade in a commodity then supply must be guaranteed. The proposal that I have developed to pipe water from the North West of Australia to the Eastern States in a national scheme that would allow for this guarantee supply. With guaranteed supply then the capacity will exist to trade in all aspects of the Individual Water Rights including;

- The Individual Water Rights; and;
- The water contained in the Individual Water Rights.

Work undertaken by the CSIRO on the Ord River Irrigation scheme and supporting research on irrigation regions in the Eastern States indicates that roughly 50% of all water entering the system is lost through supply chain (drain and channel) seepage. Obviously if this water loses could be significantly reduced then some guarantee on supply of allocations could be assured. The cost of undertaking this restructuring of the supply system would be very significant and it is unlikely that the overall cost could be recouped from increased water costs. Equally it is unlikely that the government would commit to this level of expenditure.

Cost of Water as a Supplied Commodity

Central to the concept of a tradeable water allocation is the real cost of water supplied and the price for which this water will be traded. Generally the cost of irrigation system water is quoted as its cost in the delivery channel. This can be in the range of 2.5 cents to 6.0 cents per kl ($20.50 to $60.00 per ML). The real cost however should reflect the relevant costs of pumping and pump maintenance, labour costs to pump and associated issues. Any costs beyond the actual pump or delivery system are not an associated cost, as these will apply in all cases.

Cost modelling in a range of irrigation scenarios would tend to suggest that the current real cost of water supplied to irrigators is in the range $26.00 to $32.00 per kl at a delivery rate similar to a large irrigation wheel of 450,000 to 500,000 litres per hour, (140 l/sec). From a water trading view point this raises a number of issues;

- **Water delivery system**. If water is supplied from gravity fed supply at this rate there are obvious economic advantages. If water is supplied from a channel in which case the irrigator will require the capacity to reflect the cost of supply in to their economic activity.
- **Trading Capacity.** If supply of an allocation cannot be guaranteed then the capacity to trade the allocation cannot be utilised to reflect the overall cost of the water.

Harvey Water in Western Australia is an example of a co-operative irrigation project that has independently developed the capacity to trade unused water. Harvey water has developed a supply to farmers that is pipe driven. While they retain gravity supply system they have reduced wastage from seepage by approximately 30%. This water is traded back to the Water Corporation (Perth) at approximately $1.00 per kl. This revenue is then utilised to effectively hold the real cost of water for Harvey water shareholders at a rate of 2.5 cents per kl. If the revenue from the sale of saved water is factored in the real cost of irrigation water is in the order of $18.5 cents per kl.

There is no real cost of the overall supply dam (capital cost) incorporated into this cost structure. This real cost of water is in line with the overall cost modelling that has been developed for irrigation water. The problem will be that as customers for traded water allocations vary widely the overall complexity of a trading structure will make the system unworkable.

Trading Customers as an Issue with Trading Water Allocations.

A major issue with the capacity to trade in water allocations is the overall distribution of potential customers. As was highlighted in the submission to the committee from the Murray-Darling Commission trading in water allocations allows for the opportunity cost of water to be developed. This assumes that there is open and free capacity to trade the water, either bundled or unbundled.

It is difficult to visualise a structure in which this trade could either be possible over larger areas (national) or in which trade would be effective or efficient unless a meaningful national delivery system is incorporated into the structure. If the Harvey Water example is used once again it may illustrate a point.

Harvey Water is able to trade a significant volume of water that it has effectively saved from seepage losses. Harvey Water is located within a geographic region in which it has access to one large supply of water (Perth Water Corporation) and a relatively significant group of large corporate customers. Harvey Water has developed this capacity through its own endeavours and has the capacity to trade the surplus water.

In the case of Harvey Water excess water is sold to the water Corporation at roughly $1.00 per kl. This is effectively the opportunity cost of the supplied water as the cost to the Water Corporation of the next most attractive alternative is $1.20 per kl. This is the published cost price of water from the desalination plant currently under construction.

In this case Harvey Water has the capacity to access a significant market segment that has allowed it to provide an efficient use for the water saved. In this case the revenue generated has allowed the irrigators to enjoy significant price advantages. The Harvey Water irrigators (shareholders) are not currently able to trade their water allocations outside of this relatively narrow geographical distribution as no distribution system is in place to do so.

Unless the national network established to facilitate a trading regime has the capacity to supply traded water in a broad range of locations then the resulting capacity to trade for meaningful returns will be limited. The obvious trading scenario would exist in areas where natural supply of water was either in excess or under normal “annual” supply. In this case water users with excess capacity would trade with those in drought. The problem will arise if the traded supply cannot be delivered. This incapacity to deliver may be due to;

- **Geographic reasons**. There simply may be no way to deliver the water. For example a northern NSW irrigator may not be able to trade with a South Australian irrigator, or
- **Supply limitations**. A northern NSW irrigator may be able to trade with a Mildura irrigator however there is insufficient water in the system for that system to be able to supply the water to the end user.

In a trading environment the water becomes a commodity and there has to be the capacity to deliver on the trade. Currently the system simply cannot provide this. The concept of trading in water allocations has the capacity to make the national use of water significantly more efficient and effective. This will only occur if a supply network is in place that will allow for more than distribution (and trading) within a relatively small geographic catchment. Within relatively small catchments the climate type will not vary significantly and as such the trading will be limited.

Conversely the major potential market for traded allocations are the major metropolitan water supply authorities and corporations. These organisations have a significantly higher cost base and in many cases are able to access tradeable water at the source. Large quantities of water traded away from irrigation will appear to be commercially viable for the irrigator who trades them however may have significant impact on the overall economy of the rural community from which the water is/was diverted.

This all tends to suggest that as proposed the concept of a new alternative water source be examined in detail. The concept presented for grant funding of the costing study will provide;

- An independent source of 6,500 GL of water. This will be totally "new" water independent of any current supply source;
- A piped supply structure that will cover the majority of the country and as such allow full trading with guaranteed supply to all customers on the route of the delivery system; and;
- Be independent of climate variations.

Over the past 10 to 15 years a significant number of metropolitan water supply organisations have been privatised and or distanced from governmental controls. This will create two significant issues for water supply generally;

- These relatively small independent water supply authorities have limited capacity to raise the capital costs attached with developing additional water storage and supply networks; and;
- The fragmentation of these water supply bodies has created a significant private market for water.

Both these issues create opportunities for the overall trading in water allocations however they do so from a position of a reducing overall supply. From an irrigator's view point these bodies will have the financial capacity and economic need to offer significantly higher prices for water than is likely from other potential traders of water allocations. Providers of water for domestic consumption have the capacity to price water to the end user at between 2,000 and 3,000 times the current cost of irrigation system water.

This will be the case even given a relatively restricted distribution network unless a significant additional source of water is proposed and commercialised. Trading of our current water allocations could over time result in the complete removal of our irrigated agricultural sector unless additional sources of water are provided at realistic commercial costings.

METHODS OF PROTECTION FOR RIVERS AND AQUIFERS.

(Terms of Reference point b).)

There are many organisation that monitor the overall quality of both rivers and aquifers. Collectively these monitoring groups point to a river system in environmental decline and significant on-going extraction pressures on natural aquifers.

These pressures will continue while water remains in a decreasing supply position. It is generally accepted that once on farm the irrigators are efficient and effective users of water. Wastage within the system appears to be occurring in the transport phase. This seepage from irrigation drains and channels is one of the major reasons, along with the general reduction in flooding events, for the increasingly poor state of the rivers within the environment generally.

The high levels of aquifer pumping pressures add to this environmental damage as the aquifer level drops the ground water level follows. This tends to mean that heavy rains tend not to cause flooding events as often.

Again there is a very limited number of solutions to these problems unless, as suggested, an independent source of water can be supplied. By adding to the overall water supply position there is a capacity that did not exist previously to divert water away from irrigation into environmental flows that are essential to correct the environmental damage of the river systems.

FARMING INNOVATION

(Terms of Reference point c).)

Farming undertakings are generally extremely efficient of all water at their disposal. Waste tends to be in the supply/transport and storage structures associated with irrigation.

Irrigation water usage is measured at the point that water is removed from the irrigation supply and applied to the land. In this area there are a significant number of inefficiencies that have become apparent. Large irrigation wheels will, depending on the supply, deliver in the order of 400,000 to 500,000 litres per hour and small wheels will deliver roughly 150,000 litres per hour. At this point in the bulk of Australian irrigation water usage we really don't have a really good idea as to who is using what water. When irrigators self-extract the error is likely to be greater.

At overall pricing levels of 2.5 cents to 5.5 cents per kl (in the channel) then the it is purely not material to case down relatively low value loses. For example an "over pumping" error of 5% on a 250 ML water allocation on scheme costs of 4.0 cents per kl results in 12.5 ML of over supply at a lost revenue cost of $500.00. Individually hardly worth chasing up however collectively a potentially a major drain on the resource.

The overall accuracy of these delivery measuring systems is suspect based on the wastage data being developed by a range of organisations. Equally in a situation where an irrigator self extracts (pumps) water from a channel or river system then the metering will be included on the individual pump's in-flow. This is another area in which some level of inaccuracy has been found to exist.

If Australia is to utilise its water stocks appropriately as many inaccuracies as possible must be removed from the overall system. Irrigators need to be fully aware of their water requirements to produce a specific out come. At this point the largest innovation to irrigation would be an accurate established data base of key indicators or the production of a range crops.

These key indicators should include;

- The actual amount of water required to produce a specific unit of production within the designated farming classification; and;
- The real cost of the water to an equivalent point in all irrigation farming types.

While both these issues are important the latter point is essential. At this point some irrigators have access to gravity fed systems while other irrigators have access to self pump (extraction) from system channels and drains while other irrigators have access to a self supply (private) structure. Each system operates from a different cost base and therefore has differing economics.

For example if a point of entry at the point of discharge onto the property from the irrigation supply is taken as the common point then a common "real cost of water" can be developed. In the case of a gravity supply at 500,000 litres per hour at a cost of system water of $25.00 per ML then the cost is relatively easy to calculate. (2.3 cents per kl)

In the case of an irrigator pumping 500,000 per hour from a channel (head of 3.5 metres) then the cost will include the raw cost of water, the fuel to pump, pump and foot valve maintenance and the like. In this case the real cost of water may be $250.00 per ML. ($2.50 per kl)

Equally the irrigator who has effectively created their own storage and supply then the cost to achieve the same delivery rate may include pumping costs, labour, storage maintenance etc. In this case the resulting cost may be $300.00 per ML. ($3.00 per kl)

We as a nation have the need to examine the benchmarks for the effective and efficient use of the national resource, water. Without a national established set of benchmarks there is no capacity to allocated resources to those land use types that maximise the overall return from various water intensive agricultural or industrial classifications.

This benchmarking will allow for a pricing structure that will reward efficient and effective users of water while at the same time creating an environment that may prove to be innovative enough to

encourage other users to significantly improve their individual costs of production to better utilise the lower costs associated with higher productivity.

Within Australian industry there has been significant innovations to improve the overall productivity attached to a broad range of industry types. This has not been the case within the overall system to supply water to agricultural users. There is therefore only minimal opportunity or incentive for more efficient and more effective users of water to benefit over less effective and efficient users of water.

Based on my modelling of the real cost of water onto farms and irrigation operations there are operations that are making a commercial return on capital in which water has a cost of over $2.50 per kl. Within the same economic system there are other operations that are failing to make commercial returns on system water with an on farm cost of 5 cents per kl. I believe that before we are in a position to fully commercialise a water allocation trading structure some work needs to be undertaken to make the allocation of the overall resource fare more equitable from a view point of efficiency and general productivity.

At this point there is no mechanism in the pricing of system water to reward the more efficient irrigators. This effectively means that there is no capacity to have a truly free market for water. A true free market allocation of the water resource would, or could, see significant innovations in some agricultural classifications and it is probable that this could also see the gradual reduction in other farming types.

To reallocate all system water to alternate users based on their production regime, their overall productivity or efficiency of use would be overall political suicide and as such is unlikely to be considered. The alternative is an additional source of water that is structured outside of the current supply structures.

NATIONAL ECONOMIC ISSUES.

Although the economic issues are not apparently an aspect of the overall terms of reference to this inquiry some consideration should be provided to these. The 4th – 10th August 2005 issue of the Business Review Weekly (***Farms of the Future***, P.Ruthven) highlighted a range of issues on the national contribution of agriculture to the economy. He states that in the 12 months to June 2004, the revenue of the agribusiness food and fibre chain was $310 billion, or just over 13% of the nation's total revenue of $2.4 trillion. The Agribusiness is effectively the chain of the following components;

- Agriculture, $37 billion;
- Manufacture, $73 billion;
- Wholesaling, $71 billion;
- Retailing, $102 billion; and;
- Hospitality, $27 billion

Effectively this makes agriculture a significant sector within the economy with direct agricultural s the source. Irrigated agricultural production is responsible for approximately 70% of total agricultural production and as such a significant downsizing of the available water of irrigation could effectively reduce the overall size of the agribusiness significantly.

However it is not just rural users of water that will be affected should supply significantly reduce. Business is commencing the process of lobbying for their own water supplies. For example the major power generation operations of Hazelwood Power, Loy Yang A and B, and Yallourn Energy have expressed concern on the continuity of supply and cost following the Victorian government's $1.0 billion plan to pump waste water to the La Trobe Valley. This is one scheme in one industry in one state. It is also of interest that this happened after the generation operations where moved from public ownership.

The economic consequences of failing to examine alternative sources of water that will allow meaningful trading of water will be significant to all sectors of the economy. Fully deregulated free market trading of system only water allocations will, I feel, result in the overall demise of the irrigated agricultural sector. However the economic option of having a partial water trading system will be equally disruptive to the entire economy over time.

Effectively the overall supply issue and the supply and distribution infrastructures are not in place to allow for free market-trading regime and will never be in place unless a fully national model is adopted.

CONCLUSIONS.

This submission has been developed and provided to the Senate Committee to highlight a rang of commercial issues related to the overall trading of water rights and in the pricing structure of water for irrigation water. While I fully support trading of water rights I feel that there are a broad range of issues that will make establishing a functional trading structure difficult to impossible without a national water supply and delivery system of “additional” water.

A proposal to do this has been presented to the national Water Initiative group with the aim of conducting the initial costing study for the overall concept. Without the water delivery system and the additional water supplied from this proposal I believe that the trading of water allocations will lead, over time, to the total lose of our agricultural irrigation market through resulting market demand for water.

Should you require further information please contact me on (08) 9313 3590.

Ian Marshall

B.Ag Science; B.Bus(Mkting,Admin,Eco); MBA