David Allen, Australian River Deltas, GPO 1865, Sydney, NSW 2001
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Ref: Productivity Commission – Submission into Urban Water Efficiency Submission

Dear Urban Water, Vanessa, Carole,

Thank you for slotting me in to appear before the Commission on the 31st and for allowing me to make this submission on the most important topic in Australia.

A: Introduction
My first professional involvement in Water Management occurred in 1992, when I attended a university conference of Holland's mathematicians to discuss new Sea Defences that were being constructed. My contribution, that they may not have allowed sufficiently rising sea levels, was shown to be on-the-money a decade ago when the Netherlands almost went under again.

Returning to Australia, I have made significant national contributions to limiting the extent that Australian waters are polluted by uranium, saving a significant amount of urban water in the process. In 2009, I contributed towards a scheme to make sewerage systems more efficient, saving 500 million litres of water in Sydney alone. My understanding is that Australian River Delta's (ARD) campaign to reduce pollution and improve productivity of Australia's urban waters is proving to be successful.

Good definitions based on clearly defined metrics are essential for any meaningful discussion of urban water as Water can come to urban areas in many guises. It is also useful to look at the approach that experts in other countries and cultures are taking, to ensure we are not statistical outliers. Traditional Australians have a quite detailed knowledge of Australia's urban water's productive capability.

ARD's approach is to firstly define statistical metrics that examine the productivity levels of urban water, comparing these metrics to those from past decades and using statistical tools to see where such metrics may be leading us in the future. For example, Australia's capacity to use urban water to produce food and manufactured goods has fluctuated over recent decades and it is possible to improve such metrics dramatically for little costs.

Secondly ARD examines the Urban Water Improvement Cycle using a formalized methodology that is generally accepted throughout the business world. It is useful to look at where we are now in such a cycle as we start to allocate resources to achieving new objectives. Government attention may profitably focus on the place where urban water's economic rubber hits the road – Australia's gloriously undervalued River Deltas.

ARD prefers to define objectives in terms that are measurable. We may, for example, measure the extent we improve the urban water environment for species that make a positive contribution towards Australia's economy while initiating programs that remove economically undesirable species such as cane toads that have been introduced from foreign lands. While it may be nice to ensure that the residents of areas such as Sydney

can once more swim in any body of water within their domain, this may not necessarily be the primary urban water objective, especially when poisons such as Chlorine need to be added to remove undefined 'pests' that may lurk in such waters. Another stated objective, that water-policies need to minimize the amount of water entering metropolitan waters, is similarly flawed. While Fluorine is used to prevent tooth-decay that is associated with eating sugar, its impact on Australia's valuable marine environment has not been rigorously documented.

ARD focuses on media campaigns that may have been instrumental in reducing the productivity of Australia's urban waters over the decades, comparing the metrics used in such reports against those that are accepted internationally.

Water is, of course, the most important (and perhaps the least well understood) substance on the planet as there is no life without it. Mathematical analysis shows that there are several strategies that may significantly increase the productivity and efficiency of urban water. Once the goals have been defined, programs that deliver substantial benefits for minimal cost can be implemented.

I. Opportunities for Efficiency Gains

A number of steps need to be followed when using a Methodology for designing new processes. The first step may be to describe the business and user requirements, the second may be to describe the existing set of processes etc. The final step is to conduct a Post Implementation Inquiry (PIR) to see if the promised benefits have materialised.

The most cursory investigation (PIR) into water usage over the last three decades may conclude that urban water is used less efficiently as it produces less output and the cost of making such water available has increased dramatically.

Falling Output examples include:

O1) Urban water produces less food than it did anytime in the last 50,000 years, as more metropolitan land is covered with asphalt and development. Australia is now a net importer of food, especially when the cost of imported pesticides, equipment, fertilizers and agricultural experts (who may have studied 101 Urban Water from Oxford or Harvard) is included. Indeed the cost of producing some crops such as sugar cane may be substantially higher than the rewards.

O2) Urban water produces less industrial output, as much of Australia's manufacturing capacity has moved overseas.

O3) Australia's Urban water is intrinsically present in each item that is produced in Australia. For example, each Australian grown steak or vegetable represents an amount of water that has increased over the past three decades to satisfy an ever more demanding population. Aussies like tender beef and veggies that consist mostly of sugar and water.

O3) In the same way Australian Urban water is used to manufacture items such as gold rings that are manufactured from minerals mined in Australia. As mines become ever deeper, the amount of urban water that is required to produce the minerals for a gold ring increases and the cost of gold must increase to make the mining process worthwhile.

Rising Cost examples include:
C1) Cost of producing very expensive and inefficient desalination and recycling plants that have required expensive modifications to do the job they were built for. Residents of Sydney had concerns about the locality from which recycling water was sourced and heavy flooding in Brisbane may have destroyed much of the business case for their multi-billion dollar water works.
C2) Very extensive sewerage works have been constructed to cater for the unbridled expansion of Metropolitan cities that would never be tolerated by Europe's Governance Policies and Procedures. The older sections of metropolitan sewerage infrastructure suffer from capacity and structural issues and quite a lot of money is needed to keep sewerage-sludge from spilling out of the system.
C3) Melbourne recently created a new dam so rural and urban water can be piped to their metropolitan residents. The dam was expensive and the lack water in the original catchment area carries a cost as the area is now less productive.
C4) Brisbane recently constructed the Wivenhoe (Dutch Wives Hoe) dam that was meant to flood-proof the city. Brisbane was subsequently flooded and the Wivenhoe almost caused a catastrophe as operating procedures were unclear.
C5) A dam has been built on the Ord River, allowing water to be used to irrigate a large semi-arid region. Experience shows that such agricultural work needs to be carefully managed so that it does not result in an environmental disaster that produces far less food then it used to before the dam was constructed.
C6) Billions of dollars worth of pesticides are poured into Australia's urban waters each year. Some pests such as the cane toad appear to like the stuff, while useful and economically productive species suffer.
C7) Urban wetlands and fertile urban floodplains that once produced food now display non-productive sporting fields, homes and office sites. There is evidence that a more enlightened approach is being adopted in Queensland, as the cost of rebuilding businesses and homes after each flood was becoming unsustainable.
C8) Rural (and perhaps urban) bushfire costs have escalated in recent decades as rural water is sucked into urban environments, leaving the bush scorching hot, tinder-dry and relatively unproductive, even in good years.

In summary, new regulations have been introduced, water works have been constructed at considerable expense and the result is that less food and manufactured goods are produced and Risk Management policies and procedures have been circumvented. That is Efficiency and Productivity levels have declined while Costs have risen. On a Productivity Scale of 1 to 10, average Urban Water Productivity would have been about minus two for each year over the last two decades.

Consequently there is considerable opportunity to increase efficiency in the Australian urban water and wastewater sectors.

Efficiency gains can be achieved in:
G1) Food production as water is essential for the production of all food
G2) Improved business efficiency and reduced water-costs as the water that is essential for the production of each manufactured product is readily available.

G3) Reduced wasted expenditure. For example, if adding pesticides is not an efficient way of eliminating weeds and pests, then billions of dollars can be saved each year by performing a detailed scientific evaluation before any pesticide is added to urban waters. As any gardener will testify, it is very difficult to remove weeds – they simply reappear.

II. Options to achieve efficiency gains in I-above.

2a) The economic, social and environmental impact: Water is used in each economic activity that happens on this planet and no species can flourish in an environment that is hostile towards it. Implementing the above-mentioned efficiency gains that improve agricultural productivity will by definition benefit Australia's economy. Concretely the Australian banking industry will not collapse if Australia starts using its most fertile land to produce food sustainably. The banking and insurance industries will benefit if buildings are not built on sand (or flood plains) as The Bible instructs us. Indeed major transient reconstructions after each major flood are detrimental to Australia's economy.

It is important to define what the Australian Economy really is as 101-Economics courses from Oxford and Cambridge may be perpetuating European opinions that Keynes documented in his "General Theory of Employment, Interest and Money". For example, his notes on the Trade Cycle (section vii) states that "the development of a world market … leads to an averaging out of the effects of good and bad seasons". While this statement may be true for food importing countries such as Britain, it is largely irrelevant to the continent of Australia. Similarly economic books such as those of Samuelson describe the Productivity Curve using the examples of Butter and Guns. Europeans decided to maximize both quantities, leading to butter-mountains, guns-mountains, an inability to feed themselves and an economy that is labouring under a mountain of debt in 2011. Australia can have a better defined and better performing economy.

There may be a temporary social impact from some efficiency gains in I-above urban Australians may find that some of their more luxurious activities are curtailed by a water-economy that is being moved towards what might be more appropriate in a situation of intense economic competition.

2b) The impacts to Australian government, business and consumers: Australian government needs to be more rigorous in the way it defines and regulates urban water. They may need to take more advice from Australians, especially Traditional Australians, than they currently do. Australian consumers benefit as we can once more eat good quality food that has been produced locally in a world where such commodities are increasingly becoming a luxury. Australian business benefits as new and productive avenues of business become available and one would expect to see an increase in tourism to urban areas which deliver top quality food that cannot be provided in overcrowded Europe and Asia.

2c) The propensity to facilitate supply and demand planning: Once a formalised Methodology is implemented, once well defined Statistical Metrics have been agreed and once carefully agreed Governance Policies and procedures have been set in place, then supply and demand planning becomes a formalized process with few unexpected local

surprises. An approach that works with rather than against nature would rarely require the construction of multi-billion dollar infrastructure projects such as desalination plants, especially when the evidence from Australia and America is that such projects reduce efficiency and productivity.

III. A proposed work program.

3a) Practical actions that Government can undertake, including transitional activities.

P1) Education with an Australian orientation is required, as 101 Urban Water courses from Oxford or Harvard may have little relevance to Australia. Research reveals that urban Australians may not know the direction in which their rivers flow and Authorities may not know the direction in which metropolitan ground waters flow.

P2) Develop accurate metrics and make these available to the decision-making public. The ABS may have a role to play here.

P3) Develop a Water Cycle Methodology that focuses on Australian River Deltas, the place where water's economic rubber hits the road.

P4) Remove subsidies from urban activities that are massively uneconomical. Much of Australia's eastern coastline may be considered to be urbanised, as this is where most Australians live and have always lived. Construction activity along fertile, flood-prone river flats is one such subsidised and uneconomic example, the draining of valuable wetlands is another. Providing subsidies to farmers who produce super-sweet and water-hungry crops such sugarcane that require enormous amounts of pesticides that eventually enter Australia's urban waters is a third example.

There would be a transitional activity associated with this proposal, as farmers would need to be assisted to move from subsidised unsustainable crops to sustainable ones.

P5) Stimulate the production of sustainable native Australian crops. International demand for such crops is strong and increasing as local stocks of products such as Fish are declining rapidly. It is difficult to believe that Australia is introducing legislation to turn whole classes of productive Native Plants such as the Wattle into noxious weeds. Some of Australia's valuable wetland plants have already been declared noxious because they may pose a danger to swimmers, despite the safety-evidence of the last 50,000 years.

P6) Follow Florida's example and restore urban wetlands. Florida needs potable water so they have to restore the Everglades and it is encouraging to see that mangroves are being restored in Australian cities such as Cairns.

There may be a transitional activity associated with this proposal, as people may require assistance to move from homes that may be flood-prone. This is a delicate issue, as such homes are perhaps marginal, given that many experts say that sea-levels are rising.

P7) Redesign urban sewerage systems. Sydney takes the best water on the planet, pollutes it and flushes it out to sea at a significant cost to the economy. Cities in other countries

use bio-technology to dispose of human and animal excrement and the whole process may possibly be economically positive.

The Bible contains advice about sewerage disposal that is still relevant today. A Bad Shepherd is said to be one that allows their flock to defecate in streams. In Australia, lobbyists accept that domesticated animals will do what they want where they want but such lobbyists issue highly emotional media releases whenever any human excrement is found close to any urban water environment.

P8) Ban urban pesticides. People were using Agent Orange in Australian cities just a few decades ago and the effects of such activities may last for many years. As super-sweet products such as strawberries are especially attractive for pests and require a lot of pesticides, so we could import such products from countries that pay more individual attention to their veggie-patches.

P9) Read The Bible and Traditional Australian Legends. While ch-1 of Genesis refers to Water eleven times and The Bible contains quite a lot of sensible water-advice, people tend to ignore the sections that are interesting and focus on advice that is not actually in the various scriptures that form the basis of Australia's Eurasian culture. .

Similarly about 30% of Australian Aboriginal Legends are about water management and they contain information that is relevant to water-management processes in Australia.

Water, far more than Fire, is the ultimate Truth-equaliser, exposing shoddy and unsustainable work in a flash. It is interesting that the two great revolts against the British Empire had a water focus. The Americans revolted against the Tea Tax and Ghandi's India revolted against the Salt Tax. It may be time to have a closer look at Europe's E-coli Tax that is based on reports which declare that Australia's and America's waters are full of dangerous levels of E-coli and must be purified so they are as pure as distilled water. The evidence of tens of thousands of years of history is that traditional Australian and American waters were safe for all species to drink and that it is mainly the toxicants that have been added that are causing Health issues.

As Mark Twain wrote "Whiskey is for drinking. Water is for fighting".

P10) Define water-rights in a national document such as the Australian Constitution. Aboriginal Australians were very aware of the legitimate needs of their downstream neighbours and were careful to follow the Law and allow water to flow freely and spread widely across the land. They were also acutely aware of where the economic rubber hit the road for their urban water systems and assiduously maintained the productivity of the Australian River Deltas.

Today Eurasians are turning Australian River Deltas into concrete deserts. The main exception is the Murray Delta, which was once the most fertile land on the planet according to Charles Stuurt and is now mostly a septic mess.

A. You can't stop progress
B. That's a waterfall up ahead
A. Reverse! Reverse! Reverse!

Urban Australians who live in the Australian River Delta regions are entitled to receive adequate supplies of good quality water that falls freely from the sky. Storing large quantities of potentially urban water in concrete monstrosities such as Cubbie Station's evaporation ponds is contrary to the national interest. Certainly we need to collect more local water, restoring local catchments that operate in metropolitan regions that receive copious amounts of rain most of the time.

Additionally the water that urban Australians receive in rivers such as the Swan, Parramatta, Murray, Brisbane etc should be free of harmful chemicals. The concept of using urban water to grow imported water-hungry crops such as rice in semi-arid Australia is not the most brilliant idea that has been suggested to urban Eurasians who tend to believe much of what European lobbyists tell us.

Even Einstein, who was not all that snaps *mit der Mathematik* could calculate that the land and water productivity must decline as ever more poisons are added.

Indeed Australia spends millions of dollars trying to save the whale and billions of dollars on putting pollutants into the water that, according to The Scientific American, destroy their food chain and ours.

The Scientific American reported about two decades ago that Americans (and foreign experts) had spent over a trillion dollars on regulating their rivers and that the rivers functioned better before the first dime was spent. We note that levees along the Mississippi were dynamited during the 2011 floods to save urban environments. The situation is Australia is similar, as we have followed the advice of the same international experts. Legislation that protects the Great Lakes in North America, preventing urban dwellers who live outside the basis from taking water from the Lakes, may be very relevant to Australia.

It is in the national economic interest to ensure that Australian River Deltas receive adequate supplies of good quality water on a regular basis.

3b) Priority Areas
Pr1) Stop putting unnecessary poisons in urban Australian water. The potential benefits for such actions are very limited in the short term and negative in the longer term despite the advice that learned people may offer. One publication indicated that every dollar spent on pesticides returned three dollars worth of crops. Obviously if a farmer followed this advice and spent a trillion dollars on crops, he would probably die quite quickly, inflicting enormous damage on urban water dwellers downstream.

There is no cost for this activity and it could save Australia billions of dollars each year.

Pr2) Stop subsidising the production of super-sweet crops such as sugar cane that are destroyed by each major weather-event.

There is no cost for this activity and it could save Australia billions of dollars each year.

Pr3) Stop subsidising the production of water-hungry crops such as rice that is grown in semi-arid Australia.

There is no cost for this activity and it could save Australia billions of dollars each year.

Pr4) Restore urban Australia's water catchments and wetlands, re-enabling metropolitan Australians to stop taking productive water from productive land in rural Australia.

While there is a cost for this activity, it could generate millions of dollars worth of economic activity for rural Australia. The estimated cost would be a fraction of the average yearly cost of providing super-expensive desalination and water-recycling plants. Let nature do much of this work for us for nothing, as it has always done.

Pr5) Implement Governance policies and procedures that are based on well-defined and internationally accepted scientific concepts and metrics.

While there is a small cost associated with this activity, it is essential if we are to protect Australia's urban waters from overexploitation by multinational organizations that have reliable connections with Australian media outlets.

Parallel to this process, we can start the process of 'farming' native Australian crops and fish. The market for such products is strong, tourists would be interested and the potential benefit for the Australian economy may run into several billions of dollars.

3c) Qualitative and Quantitative Efficiency Gains.
Q1) Reduced spending on Pesticides. The Australian government estimates conservatively that this is about 3.5 billion dollars per year.

Q2) Reduced spending on urban water-infrastructure. Multinational organizations announced a few years ago that they intended to make a killing on Water in Australia. Since then, we have spent billions of dollars on creating super-expensive water-infrastructure that may be unnecessary except in a one in a thousand year weather event.

Q3) Reduced food imports. Australians, with a whole continent at their disposal, should be able to feed themselves.

Q4) Better health at a reduced cost. Pesticides cause health issues and some poisons such as Agent Orange and DDT, that were probably never allowed in Europe, are now banned in Australia. However massive amounts of pesticides as well as toxic and / or radioactive minerals are added to Australia's rivers and waters each year and much of this material eventually reaches urban Australian waters in one form or another. Additionally

overproduction of foods such as sugar that may cause health problems makes a significant contribution to Australia's ever-rising Health Budget.

Australia is almost certainly spending a greater percentage of our GDP on Health than we can sustainably manage into the future, even allowing for upper-optimistic economic forecasts about the wealth that mining may bring to Australia and to the countries that are profiting from exploiting such minerals. As such minerals can only be dug out of the ground once and then they are lost to our economy forever, the time to rationalise Health spending is upon us and proposals associated with the rational management of Australia's urban waters in the Australian River Deltas could assist in this process.

4) Concrete Questions

Looking at some of your concrete questions, we note:

Q1) *Is there a strong case for reforming Australia's urban water sector?* Yes, productivity can be improved dramatically.

Q2) *How large are the opportunities for efficiency gains?* We might look at gains that easily exceed 10 billion dollars annually.

Q3) *Are some objectives more important than others?* Yes, cost / benefit analysis points Government towards more efficient ways to use urban water, once the requirements have been documented and accepted. The objectives of some groups that are concerned with urban-water are contrary to the national economic interest and require poisons such as Chlorine to implement them.

Q4) *What lessons of relevance to future reform of the urban water sector can be taken from reform in e.g. Transport? Uber-expensive* Metropolitan transport systems would be completely different to what they currently are if a Methodology were introduced a few decades ago and there may be some corruption is transport processes. The same applies to Australia's uber-expensive Metropolitan water management systems.

Q5) *Should supply augmentation planning be guided by a water security objective?* History shows that Metropolitan Australia has secure water supplies that may come under stress for limited periods of time and affordable ways to alleviate temporary shortfalls are available if we use our water supplies wisely.

On the other hand, security issues associated with Urban Water rate very highly on any analysis of Security in Australia. Examples include:

5.1 Health. Having so many water-eggs in one water-basket makes it easier for terrorists to introduce disease into metropolitan Australia.

5.2 Dam-busters. The effect of a dam-buster attack on dams such as the Wivenhoe could be catastrophic.

Q6) *Are consumers willing to pay more for water in order to forgo water restrictions?* This may depend on the level of Credit Card Debt Australians must service and Credit Card Debt reached a staggering one trillion dollars during the last decade.

The pricing structure of Urban-water is illogical. Cities that produce no food, no manufactured products and no energy can afford to pay astronomical amounts for their water and people who wish to produce food cannot compete. As competitive forces come into play, such a pricing structure must collapse, producing an outcome that favors people who put their water allocations to productive use.

Q7) *What are the main impediments to competitive pressure developing?* The ethical approach that some competitors have adopted may fail to meet acceptable guidelines, especially when the availability of good quality Urban Water is seen as a national security and sovereignty issue. Good governance policies and procedures are imperative to safeguard water supplies.

Ethics is a difficult topic and one group of senior legal people recently concluded that it has something to do with Billable-hours. The person who organized this conference then moved from one busy directorship to two busy directorships with a colleague, raising ethical questions.

Other ethical questions involve Conflict-of-interest and Illegal-association that may occur when parties meet in cities such as New York or London where the major institutional investors are domiciled. Company directors may put the interests of institutional shareholders above the interests of the people who utilize public utilities that have been privatized.

Australian ownership is preferred.

Q8) *Are existing performance reporting exercises effective in promoting improved performance and identifying problem areas*? Reporting standards could be required to meet a higher level of accuracy and integrity, recognizing that human beings have similar requirements and tolerance levels to many other species on the planet. Organizations that initiate fraudulent media releases could be punished and there are several examples of recent water-oriented media releases that could be fraudulent. Examples may include Weather-forecasting prior to the construction of expensive "("drought-proofing")" devices and reports of parasites in Sydney's water prior to the 200 Olympic Games.

Q9) *What quantitative and qualitative indicators should be used to monitor efficiency gains in the urban water and wastewater sectors?* All water on this planet has been recycled countless times and homo sapiens and other species have evolved to use water that is recycled to an acceptable level of cleanliness. Rural people tend to regard urban-water-standards as complete nonsense.

In summary, the productivity and efficiency of Australia's Urban Water can be improved by quite large margins and at relatively low costs if Statistical Metrics, an accepted Methodology and well defined Governance Policies and Guidelines are implemented. Australia is a large continent with large and reliable supplies of potable water and the reasonable expectations of all Australians can be met in a sustainable way at an acceptable cost.

Yours Sincerely

David Allen, Australian River Deltas, GPO 1865, Sydney, NSW 2001, 26 May, 2011