

Submission to inquiry into Melbourne's Future Water Supply

David T. Bath

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Overview

Any consideration of Melbourne's future water security must recognize the interlinked water supply, storage, and demand across not only the entire state, but even across the country. In particular, water accounting for metropolitan consumption, reported at 11% of Victorian water consumption, does not include water consumption for agriculture and power generation in regional areas that is ultimately consumed in Melbourne.

The current much-needed inquiry into metropolitan water security was initiated only because of pressure by the Victorian opposition, and has been hamstrung by the government's administration of the inquiry.

The proposed desalination plant is both environmentally and economically irresponsible, especially if the estimates promoted by the government are multiplied by typical cost and time overruns of other major government initiatives. Increased reclamation from existing water consumers (currently about 10%), continued efficiency improvements by major consumers, and usage of stormwater resources (including use of domestic tanks), would obviate the need for the government-proposed desalination plant that is univervally condemned by the public.

The cost of the desalination plant would be much better redirected to grossly underfunded programs such as the Stormwater and Urban Water Conservation Fund.

The Inquiry Process and Background

The current inquiry, although much needed, would not have been initiated by the government without the intervention of opposition parties.

While the total time between referral to committee (19-September-2007) and the latest due date for the report (31-December-2008) is entirely appropriate for addressing such a long-term and critical issue, it was not until late July 2008 that invitations were issued to make submissions, and the address to send them was published on the Victorian Parliament website, with submissions due by late August 2008.

This delay of over nine months between referral and the publication on the internet of the address to send submissions represents over 65% of the total time between referral and reporting.

Given that other Australian parliaments publish the address for submissions within one or two working days after referral, and indeed, provide a central page to view all current inquiries (unlike the Victorian Parliament which requires citizens to first navigate through all the pages of each committee), the metrics for administration of this inquiry, at least, raise many questions, especially combined with the stated intention of the executive to go through the tender process for the proposed desalination plant before the current inquiry reports back to Parliament.

Such failures in efficient and open governance can have very few causes, including

- a gross lack of administrative capabilities
- the cynical manipulation of politicians who have no intention of taking the results of a parliamentary inquiry into account when making executive decisions.

I hope that the report from this inquiry, if only in dissenting opinions of minority members, makes note of these failures of the process, and initiates action to determine the cause(s).

Underestimation of Metropolitan Water Consumption

The nominal 10% of Victorian water consumption (between 350 and 450 GI over the last few years) by Melbourne does not reflect true water consumption by Melbournians when taking into account the water consumed within Victoria producing goods and services for the Melbourne metropolitan region, including, but not limited to:

- Irrigation in “foodbowl” regions, which accounts for approximately 75% of Victorian water consumption.
- Industrial processes, such as power generation in the Latrobe Valley, which uses approximately 130 GI of water annually.

Such considerations indicate that the usage of water to service Melbourne's needs is much more significant than 10% of Victoria's water consumption, making management of metropolitan water use, both demand and supply, central to the development of Victorian water management policy, rather than the marginal importance suggested by a figure of 10%, and any lack of respect to the public and the inquiry process inexcusable.

Executive Preferences and Public Opinion

The preferred options of the executive, a North-South pipeline and a desalination plant have been more universally opposed by the public than any other government policy, in any Australian jurisdiction, in my memory, spanning nearly 50 years.

There has not been one letter to the editor of the Age, not one opinion piece written by those outside the government and those wishing to tender, that has supported the preferred options of the executive. Indeed, the public outcry against these options has dominated the newspapers.

Compare this to public opinions about Australia's involvement in wars such as Vietnam and Iraq, the introduction of the GST and WorkChoices. In such cases, there were at least a few elements of the public that were supportive of these controversial policies.

This state of affairs is extraordinary in a democracy, particularly where the executive claims credentials for transparency and good governance.

Grey Water Usage

A key factor to cost-effective supply of water to the Victorian economy is the way the supply can be tailored to the use. Potable water is only required for human consumption (including production of food and beverages), various types of “grey” water are suitable for many other end uses, including domestic use. This “grey” water is much cheaper to produce than potable water.

However, there are different types of grey water, which can be made grey compared to potable water by one or more of the following:

- Particulates
- Bacterial/viral counts
- Relatively non-toxic inorganic and organic contaminants (e.g. phosphates, surfactants, fats)
- Heavy metals and toxic organics
- Salt

For most uses apart from irrigation, gardening, and environmental flows, particulates can make the supplied product unusable. Luckily, particulates are easy to remove.

Moderate bacterial counts (compared to potable water) do not prevent household and industrial use for washing. Passage through environmental buffers and low-intensity purification processes can readily remove most harmful pathogens for relatively low cost and without reliance on high technology. For example, the use of “trickle filters” (essentially a giant sandpit that develops its own ecosystem) can produce near-potable water from raw sewerage providing that it serves a population of less than 10,000 persons.

Relatively non-toxic contaminants are similarly easy to remove, and do not require near-complete removal. Simple industrial processes and environmental buffers (including storage in aquifers) can handle these.

Heavy metals and toxic organics are very difficult to remove, and present an almost insurmountable hurdle to water reclamation from areas such as the Western suburbs of Melbourne with a history of heavy industrialization, or where a large percentage of water is collected after running over roads or through former garbage dumps. Even with such contaminants, it is not too difficult to imagine an industrial process to perform some purification using bacteria collected from industrial sites (such as soil around oil refineries) that can use toxic organics as nutrients, and accumulate heavy metals, especially if such strains are the subject of selective breeding or genetic engineering.

By far the hardest contaminant to remove, and the one precluding most use, is salt, which renders water unsuitable for domestic uses such as gardening and cleaning, and highly destructive of industrial equipment (including cooling systems).

Highly economical grey water use only needs separation of feedstocks to the purification process, depending on the source. Domestic outflows, as well as outflows of "stormwater" collected from non-industrial areas can be collected, subject to minimal processing and reticulated by a parallel reticulation system even to domestic supplies (for use in laundries, bathrooms and toilets). It is even practical for some industries to have on-site processing and storage of water from cooling systems for near-direct re-use, especially if these storage facilities are shared between companies in a light-industry estate.

Grey water production requires little cost to produce compared to potable water, with collection and distribution needing nothing more sophisticated than piping, and can be installed gradually whenever buildings and roads are constructed or redeveloped.

On the other hand effluent that contains heavy metals, non-biodegradable toxic organics, or salt, cannot be released into the environment, and it should be the responsibility of producers to concentrate, and store in an area that will not allow harmful products to leach into the water table.

The Metropolitan Catchment

It is worthwhile treating metropolitan areas as catchments that can provide both grey and potable water. Use of surface stormwater has been discussed above in the section on grey water, but the use of domestic (and industrial) water tanks collecting from roofs can provide a dramatic and cost-effective increase in potable water.

Here, government incentives, including over-riding council objections, can make a huge difference, especially in less-dense areas of Melbourne where reticulation is more costly. Just as new buildings can be made subject to energy efficiency requirements, new developments (or major redevelopments) for housing, offices, and industry can be required to install appropriately sized water tanks.

Another advantage of increased use of tanks is the mitigation of risks of catastrophic failure of other water supply mechanisms, be it malicious attacks on water purification plants and reservoirs, the accidental failures industrial installations are prone to, or the contamination of the water supply after bushfires.

The only real improvement on water tanks common across Australia a century ago to make them suitable for use in a metropolitan region is a means of allowing the first few litres (from a typical roof) to be excluded from collection, so that any contaminants accumulating on the roof since the last rainfall are not directed into the tank, but into normal stormwater systems, which should be selectively reclaimed.

Stormwater reclamation studies within the metropolitan region have been carried out by Melbourne Water recently. Unfortunately, the various options were required by the terms of reference defined by the government to produce individually (rather than collectively) 20Gl of potable water per annum. Even medium extraction rates from stormwater discharged into rivers and processed to potable quality cost significantly less (both capital investment and running costs) per gegalitre than the proposed desalination plant. These costs would be much lower if the product was used not for human consumption, but for grey-water uses and/or redirection into aquifers or environmental buffers.

It is worth noting that the DSE Water Report 2007 states (in “Recycled water returned to water supplies”) that “indirect potable reuse” of recycled water is “protected from the impact of climate change and would provide diversity of supply”. It is therefore unreasonable for the government to maintain its opposition to recycled water for potable reuse, especially as public opposition to indirect potable reuse is much lower than to the desalination plant.

Water Restrictions and Efficiency

Conservation efforts in the last few years, whether by major (the top 200 users) or domestic consumers, has led to a significant decrease in water consumption within the metropolitan region, of the same order of magnitude as would be provided by the proposed desalination plant.

There is no reason why efforts at water efficiency should not continue to make significant efforts, particularly if the top 2000 users rather than the top 200 users are given appropriate incentives to turn from potable to grey water. It is likely that the lower cost of grey water could provide enough of a financial without special concessions as long as the government worked to provide a grey reticulation system in a timely manner.

There is also no reason why current water restrictions need to be lifted. The major complainants are those who are concerned about gardens, and these complaints are easily addressed by gardeners choosing more appropriate plants that are drought-tolerant, and also provide better refuge for native fauna, including both vertebrates and invertebrates. Those gardeners who mistakenly believe that native and drought-tolerant garden plants are not aesthetically pleasing, nor colorful, need only be directed to the 21st Century Garden at the Geelong Botanical Gardens with a very modest publicity campaign, which would allow nurseries providing plants to metropolitan consumers to change their lines of stock (and decrease the costs to their businesses from water usage on inappropriate plants at the same time).

Personally, I cannot understand why some Melbournians are overwrought at the current mild restrictions, when many provincial cities have had much more onerous restrictions for a number of years. Even Stage 4 restrictions in areas such as Geelong and the Bellarine Peninsula are lax compared to the discipline required in Western Victoria at some times in the 1960s, when I can recall restrictions on the number of showers and baths in a given week, and the depth you were allowed to fill your bath.

Desalination Plant Risks

The proposed desalination plant is estimated at \$3 billion (today's dollars), and produce 150GI annually, with some talk of an increase to under 200GI annually.

This is perhaps the most environmentally and economically irresponsible proposal a Victorian government has made in history, and has deservedly received universal condemnation from all but the government and those who stand to get direct financial gain.

Apart from the environmental impact of both the collection of seawater and the discharge of brine, which I am concerned about but not qualified to comment on, there are many economic analyses that suggest that this proposal is expensive not only to other means of supplying water, but compared to other desalination plants across the world. Committee members need only read the numerous articles appearing in *The Age* over the last year or so to see economic criticism of the desalination plant and the processes the government is using to push this plant against public wishes: analyses that have received no substantive rebuttal from the executive.

There are two considerations that have not been played in the media that I will address:

The desalination plant presents a major point of failure if we depend on its water that can cause significant damage to the Victorian economy. Western Australia is suffering from over-dependence on a single supply of gas, and suffering for far longer than Victoria's problems when our gas supply was constrained by a refinery explosion a few years ago.

Further, given the spending on anti-terrorist activity by governments, it is strange that with such awareness, the attractiveness of the desalination plant as a terrorist target has been overlooked.

We must also consider the ongoing costs of the power required to generate that 150GI : 90Mw from the grid (using a not inconsiderable of water itself), and the carbon dioxide by-product from burning the coal that will be the probable energy source.

Claims by the government that the project would be carbon neutral are disingenuous when we have to make cuts to carbon pollution overall, and the national (and state) carbon pollution budget will probably be subject to an international regime of per-capita carbon emission restrictions, not mere reductions from the very damaging levels we currently use.

We must further question whether the \$3 billion dollars is a realistic estimate if we factor in the time and cost overruns of most of the major projects developed under PPPs, especially as the difference in interest rates charged to governments are much lower than that charged to the companies that would be financing the project, and interest rates for Australia, already high by OECD standards, are unlikely to fall in the next decade or two until our national indebtedness is significantly decreased. (With more than 10 years running a current account deficit at around 5%, now over 6% of GDP, our national indebtedness will not become manageable for many years, especially if China keeps moving from a resource-intensive economy to a high-value added economy, with companies like Huawei leading the charge).

Another major problem of any desalination plant, even if it were economical, becomes obvious when considering the utility of its product if only marginally less than it's specified water quality. Whereas imperfectly purified water from other reclamation mechanisms still has some use (e.g. in cooling systems), water with salt much above drinkable levels is almost useless for irrigation, industry, environmental flows, returning to aquifers, and any domestic use.

In short, the desalination plant proposal makes no sense from an economic viewpoint, is likely to be extremely harmful to the environment, will provide less water than other measures, and will be disastrous politically for the current government. The proposal seems criminal, the processes seem flawed, and no-one is likely to benefit other than large companies and those in their pay.

Agricultural Planning

With such a large percentage of Victoria's water consumed by irrigation, it is necessary to look at agricultural policy and the selection of crops grown in Victoria.

Even simple things like moving, wherever possible, from food grown above the surface (e.g. grain, grapes, rice), to sub-surface crops (like potatoes), should be considered.

While slightly out-of-scope of the current inquiry, the interdependence of surface and ground water across Victoria, and the large "virtual water" consumption of regional Victoria's water by Melbournians, makes agricultural policy an important part of water security for the state, including Melbourne.