

Water, Fire & Heat: Summer is Coming

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I will be focusing on sustainably managing Melbourne's water resources into the future. In order to do this, it is prudent to look at and learn from the past, assess where we are at present, in order to have the courage to seek new and better ways of doing things into the future.

So lets take a brief look at how we have managed our water resources in the past...

Prior to 1788 Aboriginal Australians managed our natural resources sustainably.

When Europeans arrived in Sydney, many immediately commenced activities which impacted detrimentally on the natural balance...

Perhaps learning from Sydney's mistakes, Melbourne's early planners had the foresight to protect our catchments... creating a legacy in 1888 through the closure of our water supply catchments that we are still grateful for today.

Melbourne's big infrastructure projects such as the initial sewerage of the city in 1897 and augmentations to the water supply system were more often than not engineering solutions to major issues 2 and public outcry... our city was referred to as "Smellbourne" and rife with water borne disease prior to the construction of the sewerage system. Residents from East Melbourne and Richmond are known to have sent samples of water from their taps containing black sludge and wire worms to The Age to illustrate the poor quality of water supplies prior to system augmentations and closure of the catchments. Typically increasing public pressure and a major issue such as a pandemic or drought would

combine to generate investment in major water or sewerage infrastructure works.

In 1982/1983 water restrictions lead to the construction of the Thomson Dam... which, at the time, was touted as 'drought proofing Melbourne'... we have learnt from this mistake and certainly don't make statements such as this in the face of our increasing population and climate change.

In recent years a more integrated approach to managing our potable water resources has emerged with greater emphasis on a range of measures including water conservation.

In contrast to the preference for major engineering solutions associated with managing our potable supplies and sewerage system, our waterways and drainage system were overlooked for many years. The Yarra itself was used as a sewer for early industries in Abbotsford and Richmond and the Maribyrnong River reportedly ran red at certain times with the discharges from abattoirs.

Stormwater was considered a nuisance, to be removed as quickly as possible resulting in the piping of many creeks and smaller waterways up until the 1970's.

In the 1980's the tide started to turn, rivers and local waterways started to be regarded as community assets and the concepts that grew into Water Sensitive Urban Design started to evolve.

However, in the early nineties it was still prohibited in some municipalities to have

a rainwater tank and numerous papers were circulating through water authorities discussing why they were a bad investment.

Around this time there was the identification of nitrogen loads entering Port Phillip bay as a potential threat to its health with the risk of eutrophication occurring – the potential for algal blooms in our front yard (remember that this is an ongoing problem already occurring in the Gippsland Lakes (which are essentially our backyard). This translated into targets and legislation for achieving a 100 tonne reduction in Nitrogen loads to neutralise this risk: 50 tonnes to be achieved through improvements to treatment processes at WTP and 50 tonnes to be achieved improving stormwater quality.

Thanks to a collaborative, multi-disciplinary approach with regard to these efforts, WSUD is now status quo.

However, it is not time to rest on our laurels! The latest research just published by Dr. Amy Hahs and Assoc Prof Mark McDonnell at the Australian Research Centre for Urban Ecology, working in collaboration with scientists around the world have identified that under current planning and design practices, it is very hard to maintain 30% native vegetation within an urban area, and that once vegetation cover falls below this, cities can expect to lose a significant proportion of their native plants – this regardless of the current number of species in existence in the more recently established cities. The phenomena is being referred to as 'extinction debt'. Across the globe, the cities which can expect to lose the most plant species over the next 100 to 150 years are Melbourne and Adelaide. Indeed, unless more is done to intervene, the researchers expect Melbourne to lose more than half of its 1200 original plant species over the next 100 years.

Clearly, if we want to keep plant diversity in our cities, we need to protect and restore areas of native vegetation... These findings also correlate with information emerging regarding percentage

of imperviousness within our catchments being closely linked with the health of our urban waterways.

The next stage in WSUD evolution could be the incorporation of biodiversity considerations into our planning and management practices. These concepts are currently being explored in projects to develop Best Practice Guidelines for Urban Ecological Management and the creation of a CRC for Urban Greening and Ecology. But these are proposed future initiatives... before we look to the future we let us first further examine our current situation!

Up until quite recently water resources were generally managed in isolation from each other. Potable water supplies, the sewerage system, waterways and drainage and groundwater have typically been managed separately.

Increasingly the flaws in the siloed management framework have been recognised, together with an acknowledgement that the 4 year cycles of the political process could be detrimental to long strategic planning decisions.

As the push for integrated water resources management gathered momentum, in an attempt to create more sustainable outcomes in relation to water resources, the Victorian Government released a quite progressive policy in 2004 via the White Paper: Our Water Our Future - Securing Our Water Future Together. Fundamental principles stated in this document include:

[and I quote here directly:]

- *The management of water will be based on an understanding that a healthy economy and society is dependent on a healthy environment.*
- *Users of the services our water system provide should, wherever practical, pay the full cost, including infrastructure, delivery and environmental costs associated with that service.*

- *The water sector, charged with managing our water systems, will be capable, innovative and accountable to the Victorian community.*

A key challenge addressed through the white paper that represented a major step forward was the commitment to developing a water allocation system that “recognises all water services and balances the needs of the environment with the needs of water users”.

This commitment, supported through legislation, the establishment of Sustainable Water Strategies for long-term State and regional planning.

The need for integrated water resources management and long term strategic plans is becoming increasingly important as the impacts of climate change become apparent. At no other time in our history have we been faced with the need to re-evaluate all of our approaches to managing all aspects of our water resources at the same time – to attempt to assess the potential impacts separately does not make sense and will more than likely lead to sub-optimum outcomes.

But beyond just the consideration of managing our water resources, the water industry itself, as a major contributor of greenhouse gas emissions through energy intensive treatment processes and pumping activities, must also show accountability for its climate change impacts. This accountability is being recognised through investments being made in renewable energy sources such as mini-hydro and biogas generators by water authorities.

But on balance, how are we actually travelling at present. How is our sustainability scorecard looking? Have we really embraced these new philosophies in our decision making processes? Are we incorporating TBL evaluations into major strategic decisions to facilitate sustainable management of our water resources?

To answer these questions it is perhaps

worthwhile reviewing outcomes from the 1st Central Region SWS released in October 2006 and the discussion paper for the Gippsland SWS - currently being developed; and also review some major water infrastructure investments: the desalination plant committed for construction at Kilcunda; the north-south pipeline currently being constructed to bring water from the Goulburn catchment into Melbourne’s supply system; and the business case for taking recycled water from ETP to Gippsland for use in the cooling towers of the power stations.

But firstly, a few background facts to set the scene:

Melbourne currently sources 89% of its water supply under bulk entitlements from rivers. Approximately 64% of this supply comes from the Yarra catchments and 26% via the Thomson Dam – diverting water from the Aberfeldy and Thomson rivers in Gippsland that would naturally flow through to the Gippsland Lakes. In volumetric terms this means that Melbourne diverts approximately 168,130 ML per year of water from Gippsland catchments into Thomson Dam.

A further 156,700 ML per year is currently available via bulk entitlements for diversion from the Latrobe River for use in the power stations which supply Melbourne’s electricity. (Currently approximately 94,000 ML per year of these entitlements are used.)

In Melbourne approximately 61% or 292,100 ML / yr of our potable water supply is used in residential applications. This means we are flushing about 41,000 ML/yr of our potable supplies down the toilet.

Both the Thomson and Yarra Rivers have been identified as flow stressed in recent studies. In the Central Region SWS environmental water reserves were established for each river. An additional 20,000 ML/yr in the Yarra and an additional 47,000 ML/yr in the Thomson was identified as required to meet scientific study

recommendations to maintain environmental values, sustain biodiversity, and preserve ecological functioning and water quality in these rivers.

The Thomson (and Latrobe) rivers also feed into the Ramsar listed wetlands of the highly valuable Gippsland Lakes.

In late 2005 the Victorian Government announced that 10,000 ML/yr of additional water would be provided as environmental flows into the Thomson River.

In September this year it was announced by the Victorian Government that 10,000 ML/yr of additional water would be sourced from the Thomson to augment Melbourne's water supplies.

At present, the vast majority of Melbourne's sewage goes to one of the two major treatment plants: 57 per cent goes to Werribee and 43 per cent or about 135,000 ML/yr goes to Carrum. We currently reuse 11 per cent of this resource or about 35,000 ML/yr as recycled water. The rest is discharged into Port Phillip Bay or Bass Strait at Gunnamatta beach.

A \$4.4m feasibility study and business case completed in 2006 evaluated a proposal to take 114,000 ML/yr of recycled water from ETP to Gippsland for use in the power stations. Under this proposal the use of the recycled water would 'free up' 139,000 ML/yr of higher quality river water currently held in bulk entitlements by the power industry for reallocation to local rivers, and perhaps more contentiously, to augment Melbourne's supply system.

In a TBL assessment this proposal was compared with alternative options including constructing a new dam and a desalination plant. Based on the evaluation criteria, *"the study determined that the EWRP was superior in triple bottom line terms to alternatives (desalination and dams) as a means of sourcing equivalent volumes of drinking water and / or meeting river health needs"*.

This is essentially because the proposal offers significantly greater benefits than dams and desalination when assessed against environmental and social criteria including ocean outfalls, water efficiency, the Regional Outfall Sewer impacts (Gippsland) and positive impacts on the Ramsar-listed Lake Wellington / Gippsland Lakes system..... [big pause here] what is even more interesting to note is that energy use, loosely equivalent to greenhouse impacts, were not included in this evaluation.

If we consider the energy use / greenhouse emissions associated with each of the options evaluated, the EWRP comes out significantly ahead of desalination in terms of operating expenditure – even with the inclusion of a pipeline bringing some of the reallocated water supplies into Melbourne.

The Central Region SWS states that "actions implemented under this strategy, when considered together, will aim to result in no net increase in carbon dioxide emissions" and that "lower preference is given to options that generate high volumes of greenhouse gas". Furthermore, it explicitly states that *"Decisions should be transparent in terms of the benefits gained or costs imposed, including impacts to natural assets"*.

... And yet we are now in the process of constructing a north-south pipeline to bring water from the Goulburn catchment – which is part of the greater Murray-Darling system – one of the most complex and stressed river systems in Australia. We are also constructing a desalination plant reportedly at a capital cost of over \$3.1b and with the expectation that this supply source will double the average residential water bill.... Neither of these options appear to deliver any tangible environmental benefits and it is difficult to understand how the decision process for each of these projects was made... as Melissa Fyfe, political editor for The Sunday Age has found, neither of the business cases for these projects are being released by the Victorian Government under

Freedom of Information requests due to their commercial sensitivity.

The Gippsland Region SWS discussion paper released in July 2009 states that there may be opportunities for large scale recycling projects. *"However, some large projects have proved too expensive to proceed with at present. This was recently shown for two large scale recycled water projects linked to the ETP"*.

It would appear that somewhere between the release of the Central Region SWS in October 2006 and the release of The Next Stage of the Governments Water Plan announced in June 2007, that some major decisions were made without the transparency we were lead to expect and that these decisions have not capitalised on opportunities for Melbourne to repay its environmental debt to Gippsland while simultaneously augmenting the supply system.

So what are the ramifications of this for the future?

Well firstly, we need to be aware that SWSs are an ongoing iterative process – legislation requires them to reassessed every 7 years or sooner if required.

Secondly, we should note that the Gippsland SWS is not yet finalised – so there is still the opportunity to influence outcomes.

Each and every one of you here today can influence change – but it takes a bit of courage and conviction. Change is uncomfortable – maintaining the status quo and criticising others is a much easier option. But think about this... If there are 500 people here tonight and each of you commits to 1 hour per week to actively do something to promote improved management of our natural resources: that's 500 hours per week of effort, 2,000 collective hours per month or 260,000 hours of collective effort per year... it doesn't take long to add up and make a difference. You can also demonstrate leadership by taking action - participate in programs being

developed by advocacy organisations such as Environment Victoria, write a letter, go beyond purchasing a rainwater tank and purchase an on-site water recycling system and solar panels to operate it.

The onus is really on us to take some responsibility and engage with the processes that can promote beneficial change.

Government should not be criticised for not taking action or making the wrong decisions if they have not been given clear messages by the people they are representing about what our expectations are.

In order for the integrity of our democratic system to be maintained we must be actively involved. It's a numbers game... Gippslanders don't have the numbers in terms of votes to gain environmental justice for the use of natural resources located in that region – Melburnians have the numbers to make a difference if we take accountability for the resources we benefit from.

If we truly want to move towards sustainably managing our water (and other natural) resources we must be accountable and seek to ameliorate our negative impacts on the environment. We cannot allow environmental and social parameters to be continually downplayed in decision making processes.

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