

... no higher quality water, unless there is a surplus of it, should be used for a purpose that can tolerate a lower grade.

(United Nations Economic and Social Council, 1958)

Water

6.1 The management of water is one of the most critical issues faced by Australian cities face today and into the future. While every city's situation and water resources are different, all Australian cities are facing a growing water deficit as population growth drives demand and, most ominously, climate change causes a reduction in rainfall and a consequent much greater reduction in run-off. For example, the mean yearly stream flow from 1911-2003 in the Perth catchment was 285 billion litres. From 1975-2033, it had reduced to 164 billion litres.¹ The Committee was left in no doubt that several of our cities, especially Sydney and Perth, are in danger of significant water shortages.²

6.2 Dr John Marsden discussed these two cities with the committee at a Sydney hearing, but argued that while their challenges are similar, their responses are not:

Putting it in a wider context, this supply gap issue is occurring in most Australian cities. The climate risk and the long-term climate variability issues will affect them all. The strategic responses across Australian cities are highly variable. They are probably best in Perth. The analogy that we have been discussing is that Perth knows that it is on a cliff. In fact, it is on the cliff face, it has its ropes on, it has its mountain climbing boots on and it has all the

1 Barton Group, *Australian Water Industry Roadmap*, 15 June 2005, p. 14.

2 See for example Port Jackson Partners Limited Report prepared for the Business Council of Australia, *Reforming and Restoring Australia's Infrastructure*, March 2005, pp. 74-75.

gear. It knows it is there and it is scaling it, whereas in Sydney I think up until very recently it has been wandering around in a fog denying that there might be a cliff anywhere.³

6.3 The committee received evidence on a range of measures that can be employed to harvest more water for our cities and use less of it. Water has to be regarded as a vital, valuable commodity. Our water use has been so wasteful that in many respects the problem is not one of water shortage, but of wasteful, unsustainable and environmentally irresponsible management of water. The solution does not lie in one approach or one technology. Australia's cities have an urgent need for an integrated approach to water management which:

- reduces water use by more efficient use of water;
- recycles waste water; and
- adds to the water supply of our cities through better harvesting of run-off and in those cities where it is required by desalination.

All management, use and delivery methods should be used where appropriate, rather than having different methods competing against each other.

Integrated water management

6.4 Dr Harry Blutstein explained that the community needs to have a better understanding of the environmental consequences of different types of urban development as they impact on water usage:

People say, 'I'd love a really great tarmac here and a footpath here – and I don't want any potholes in it,' but they are not saying it with an understanding of sustainability. Once they understand that, people might say, 'We want grass nature strips. We don't want concrete drains; we want grassed swales that will take the water and absorb it.' So suddenly we start to re-envisage our landscape. But that can only happen if people ask for it; if you try to do it without the education it will not happen.⁴

3 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 13.

4 Dr Harry Blutstein, *Integrating Sustainability*, *Transcript of Evidence*, 6 March 2004, p. 63.

- 6.5 The committee received a considerable amount of evidence on the integration of all aspects of water management. In a submission to the committee, the CSIRO summarised ways to address issues relating to water provision in urban areas and the treatment of wastewater and stormwater. This included research programmes, a Commonwealth investment package, major policy and institutional changes, and ‘scorecards’ for water efficiency of appliances and buildings.⁵
- 6.6 The committee notes that the Australian Government has taken a leadership role and acknowledged the importance of integrated water management through the National Water Initiative, but that much remains to be done in relation to the education of the public.

National Water Initiative

- 6.7 At its meeting of 25 June 2004, COAG agreed to a National Water Initiative (NWI), a comprehensive strategy driven by the Australian Government to improve water management across the country.⁶
- 6.8 The NWI encompasses a wide range of water management issues and encourages the adoption of best-practice approaches to the management of water in Australia.
- 6.9 In particular, the NWI should result in:
- expansion of permanent trade in water, bringing about a more economic and efficient use of water and more cost-effective and flexible recovery of water to achieve environmental outcomes;
 - more confidence for those investing in the water industry due to more secure water access entitlements, better and more compatible registry arrangements, better monitoring, reporting and accounting of water use, and improved public access to information;

5 CSIRO, *Submission 91*, p. 14.

6 The information on the National Water Initiative (including the Australian Government Water Fund, Water Smart Australia, Raising National Water Standards and Australian Government Water Fund Communities) comes from the Department of Prime Minister and Cabinet, see www.pmc.gov.au/nwi. The committee notes that Tasmania and Western Australia did not sign the agreement. Western Australia did not see a real benefit for the state, while Tasmania will continue to discuss opportunities with the Australian Government for cooperation on water reform.

- more sophisticated, transparent and comprehensive water planning that deals with key issues such as the major interception of water, the interaction between surface and groundwater systems, and the provision of water to meet specific environmental outcomes;
- a commitment to addressing water systems where users have been allocated more water than can be sustainably drawn from that water system as quickly as possible, in consultation with affected stakeholders, addressing significant adjustment issues where appropriate; and
- better and more efficient management of water in urban environments, for example through the increased use of recycled water and stormwater.

6.10 Water reform is driven at the national level by the National Water Commission, which is an independent statutory agency within the Prime Minister's portfolio. The Commission's role is to help implement the NWI agreement, and invest under the Australian Government Water Fund.

Australian Government Water Fund

6.11 On 13 September 2004, the Prime Minister announced a major commitment to the Australian Government Water Fund.

6.12 The Australian Government Water Fund is an investment of \$2 billion over five years by the Australian Government in water infrastructure, improved knowledge and water management, and better practices in the stewardship of Australia's scarce water resources. The Fund is made up of three programmes:

- Water Smart Australia;
- Raising National Water Standards; and
- Australian Government Water Fund Communities.

6.13 The National Water Commission will advise and make recommendations to the Commonwealth in relation to two programmes under the Australian Government Water Fund: Water Smart Australia and Raising National Water Standards.

Water Smart Australia

6.14 The Water Smart Australia programme is designed to accelerate the development and uptake of smart technologies and practices in water use across Australia.

6.15 Competitive bidding will be the primary mechanism for allocating grants. The type of projects that could be eligible include:

- improving river flows;
- on-farm water use efficiency improvements;
- cost-effective recycling and re-use of urban stormwater and grey water; and
- more efficient water storage and transmission facilities.

Raising National Water Standards

6.16 The Raising National Water Standards programme will invest in Australia's national capacity to measure, monitor and manage its water resources. These investments will be designed to help achieve NWI outcomes. Projects that could be eligible include:

- facilitating a nationally consistent system for collecting and processing water data;
- strategic assessment of groundwater resources;
- working with local communities to improve the conservation of water systems with high environmental values through measures such as planning, voluntary conservation agreements and improved knowledge; and
- establishing and promoting the Water Efficiency Labelling Scheme for household appliances, and implementation of the Smart Water Mark regime for household gardens.

Australian Government Water Fund Communities

6.17 The Australian Government Water Fund Communities programme will provide grants to communities to promote wise use of water. This programme will be administered by the Department of the Environment and Heritage.

6.18 The committee believes that the NWI will yield benefits for urban water management. The NWI also provides an integrated approach to water management.

6.19 The committee has considered water management as three elements, and provides analysis of each of these:

- Water efficiency and education;
- Water sensitive urban design; and

- Decentralised water delivery.

Water efficiency and education

Water recycling and desalination

- 6.20 The committee is of the view that Australia urgently needs to substantially increase the amount of wastewater which is recycled. While some communities in Australia do recycle a substantial amount of their wastewater, overall Australia's record on recycling is very poor and compares unfavourably with the position in other, comparable, developed countries. Sydney is probably the worst case, recycling less than 3 per cent of its wastewater and pumping about 450 billion litres or nearly 75 per cent of its annual water usage out to sea as barely treated sewage.
- 6.21 The committee notes the water systems in Australian cities operate on a two pipe system only: a pipe with fresh, potable water coming into the home or business premises and a pipe with waste water or sewage going out. In an ideal world, premises would receive an additional, third, pipe which would deliver recycled water to be used for purposes other than human consumption. The bulk of water used in Australian homes is not consumed by humans, but is rather used on the garden, flushing lavatories, washing cars and for many other purposes that do not involve ingestion of the water. While there is no scientific or medical obstacle to rendering recycled water safely drinkable (as is the case in many cities overseas), there is perceived to be public reluctance to allow recycled water directly into the drinking water system. Consequently, the lack of a third pipe is often cited as a reason or excuse for not engaging in recycling and reuse of water.
- 6.22 There are at least two responses to this objection:
- There are already considerable opportunities to substitute fresh potable water with recycled water which do not require a major re-plumbing of Australia's cities. These include large industrial users, parks, golf courses, agriculture and, most importantly, the restoration of environmental flows in rivers which have been depleted by water harvesting by dams.
 - Recycling of wastewater represents in the case of most of our cities the only opportunity (apart from desalination) to add substantially to the sustainable yield of water.

6.23 The committee notes that the Victorian Parliament's Outer Urban/Interface Services & Development Committee's report *Inquiry into sustainable urban design for new communities in outer suburban areas* makes the following recommendation regarding third pipe systems:

- Funding of further pilot projects to advance the use of third pipe systems; and
- That the Victorian Government undertake a study into the long term savings and broader social gains of water recycling technologies, particularly third pipe systems.⁷

6.24 The committee supports these recommendations.

6.25 The City of Melbourne has also instituted its WaterMark campaign which aims to:

- Drive improvements in the efficiency of water consumption
- Seek alternative water supplies to replace potable water consumption where potable water is not required (eg: irrigation)
- Maximise opportunities for water recycling

The Campaign will involve residential, industrial and commercial sectors of the municipality as well as City Council's own operations. Each sector will be assigned a reduction target relevant to the sector's water usage profile and its potential for efficiency gains. Global Compact signatories can contribute to the achievement of the efficiency targets through participating in a City-led water efficiency program.⁸

6.26 The Department of Environment and Heritage is already utilising grey water recycling within its main tenancy, the John Gorton Building in Canberra.⁹ The committee believes that all government departments and agencies that own property should follow this example. Agencies that rent property should consider building efficiency, including grey water re-use, when seeking tenancy agreements. This is further explored in chapter 7.

6.27 The committee notes that some councils have been inundated with applications by residents to install grey water recycling in their home and business premises.¹⁰

7 Parliament of Victoria Outer Suburban/Interface Surfaces Development Committee, *Inquiry into sustainable urban design for new communities in outer suburban areas*, September 2004, p. 121.

8 City of Melbourne, *Submission 187*, p. 11; see also Dr Phil McManus, *Transcript of Evidence*, 29 April 2005, p. 42.

9 Department of Environment and Heritage, *Submission 157*, p. 4.

10 Ms Juanita Manahan, Southern Sydney Regional Organisation of Councils, *Transcript of Evidence*, 29 April 2005, p. 47.

- 6.28 Environment Business Australia comments that not only are we losing potentially re-usable water, but soil nutrients as well:

Water recycling and stormwater capture and use should be top priorities instead of allowing polluted water to leak into waterways or to be discharged via deep (or not very deep in some cases) ocean outfalls. Much needed soil nutrients are being disposed of instead of being returned to replenish thin and nutrient depleted soils.¹¹

- 6.29 The committee was made aware of the unfortunate situation where, when options for water savings are put to the general public, the option of water recycling is not presented as the judgement is made that the public is not ready for it.¹² The committee believes Australia is out of step with global developments in this regard. It notes that Israel, for example, recycles 70 per cent of its wastewater and in the United States (especially in California), there are many communities which have achieved similar or higher levels of recycling. The committee notes that in countries where several cities or towns are located on the banks of great rivers (such as in Europe) every community is, in effect, drinking the recycled water of the upstream communities, as water is drawn from the river, consumed by residents, recycled and then returned to the river to flow downstream to the next town.
- 6.30 If third pipe systems are put in at the greenfield stage of a development, they will not add significantly to the cost of water services. Retrofitting is a more expensive process.¹³
- 6.31 Another barrier to water recycling is marketing. Some produce markets that sell fresh produce try to differentiate themselves as *not* using recycled water, thus adding to the misplaced perception that recycled water use is somewhat unhealthy or undesirable.¹⁴
- 6.32 Recycled water is able to be substituted with existing sources and, when done on a large enough scale, it will make a large difference to the water demands of a city and larger localities. As outlined above, there is currently timidity with producers using recycled water.¹⁵

11 Environment Business Australia, *Submission 92*, p. 6.

12 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 3.

13 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 3 and p. 5.

14 Mr Peter Jacob, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 4.

15 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 5.

- 6.33 The committee heard evidence that current recycling technologies are adequate for current needs:

Frankly, with off-the-shelf solutions and suitable regulatory monitoring by existing agencies, such as health agencies and EPAs we have adequate technology to deliver safe and secure potable water to urban population using existing recycling technology.¹⁶

- 6.34 It is clear to the committee that what is lacking is public knowledge and understanding of the desirability of the use of recycled water. The committee notes that in the State of California, there has been a continuing debate about recycling and desalination and that this debate has been informed by a considerable amount of material being made available to the public and to communities to enable them to make informed decisions.¹⁷

Recommendation 12

- 6.35 **The committee recommends that COAG, as part of the National Water Initiative, fund an education campaign educating the public about the benefits, economics and safety of using recycled water.**

- 6.36 The committee learned that the situation in Sydney provides an excellent example of how a major water recycling campaign could change the water situation.

- 6.37 In a May 2005 report, the NSW Auditor-General observed that:

Sydney has been using more water than its storage system can provide. Sydney's water scarcity is not simply a problem related to drought. Sydney's water supplies are inadequate to meet long-term metropolitan demand requirements.

While it is possible to over use water in the short to medium term, the long-term result will be an increase in water shortages and the need for earlier and more stringent water restrictions.¹⁸

16 Mr Dennis O'Neill, Australian Council for Infrastructure Development, *Transcript of Evidence*, 29 April 2005, p. 41.

17 For further information on recycling in California, see www.owue.water.ca.gov/recycle/index.cfm

18 Auditor-General's Report, Performance Audit, *Planning for Sydney's Water Needs*, May 2005, Executive Summary.

- 6.38 The current Metropolitan Water Plan in Sydney prepared by Sydney Water is based on work by the Sydney Catchment Authority. Criticisms of this plan suggest that the plan ignores environmental flows, is based on continued restrictions,¹⁹ and is based on rainfall and run-off averages over the past ninety years, which overstate the current sustainable yield because of the recent, significant, reduction in rainfall caused by climate change.²⁰
- 6.39 The committee heard evidence that an alternative proposal by Services Sydney, involving a large recycling strategy, would meet water requirements.²¹ That proposal allows a buffer for a downward revision in sustainable yields, taking into account environmental flows and, based on conservative estimates, represents a lower cost solution than the only other alternative of large scale desalination.²²
- 6.40 The committee is not in a position to make a conclusive recommendation in relation to these two plans. The committee notes that other cities similarly situated are embracing recycling and that Sydney's persistence in disposing of almost all of its wastewater as partially treated sewage is almost without counterpart. The committee believes that there needs to be a robust and well informed debate about recycling in Sydney and other Australian cities. Further, it is the kind of debate that is stifled when water recycling is taken off the public agenda.
- 6.41 Another of the major options for increased water supply currently being investigated in a number of cities is desalination.
- 6.42 The committee heard evidence that, while desalination may be a good option for Perth, in a city such as Sydney, much more needs to be done with water infrastructure and re-use before genuinely considering desalination.²³ The committee notes that in response to public concern about the energy requirements (and greenhouse implications) of desalination, the NSW Government has announced contingency plans, so that by mid-2006 construction could commence on a desalination plant capable of producing 500 million litres per day on the Kurnell peninsula unless there is a break in the drought. The consultants report,²⁴ published

19 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 12.

20 Auditor-General's Report, Performance Audit, *Planning for Sydney's Water Needs*, May 2005, Executive Summary.

21 Mr Peter Jacob, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, p. 10.

22 Dr John Marsden, Marsden Jacob Associates, *Transcript of Evidence*, 28 April 2005, pp. 10- 12.

23 Mr Hugh Ralston, Warren Centre for Advanced Engineering, *Transcript of Evidence*, 28 April 2005, p. 46.

24 GHD Fichtner, *Planning for Desalination*, Report prepared for Sydney Water, July 2005, p. 43, Table 8.1; see www.sydneywater.com.au/EnsuringTheFuture/Desalination

by Sydney Water at the time of the announcement, projects a capital cost of \$1.75 billion for the plant with a levelised cost of freshwater of \$1.44 per kilolitre or \$252 million per annum for the total output of 180 billion litres. The committee notes that a necessary component in the financing of such a large plant would be a take or pay contract, such that if improved rainfall resulted in the desalinated water not being necessary, Sydney Water would nonetheless be obliged to pay a large percentage (typically 60 per cent) of the contract price. This could, therefore, result in Sydney Water being liable to the operators of the plant for \$150 million in a year when no freshwater was produced at all.

6.43 The committee is aware that there are other issues that need to be considered when examining options to increase water supply. A major consideration is energy use in water treatment. A research brief prepared by the Parliamentary Library found that the treatment of wastewater to a high level can be very energy intensive. The type of water targeted for recycling or reclamation is therefore an important consideration. Energy consumption requirements, per kilolitre of potable water produced, are as follows:

- 3 to 5 kilowatt hours (kWh) for reverse osmosis of seawater (desalination);
- 0.4 to 0.6 kWh for conventional water treatment;
- 0.7 to 1.2 kWh for brackish reverse osmosis; and
- 0.8 to 1.0 kWh for wastewater reclamation.²⁵

6.44 A crucial step when planning water treatment plants is to take into account the energy efficiency of plant operations and the type of energy used. While desalination of seawater uses the most energy, it is noted that wastewater treatment plants generate substantial greenhouse gas emissions, particularly methane. The committee notes that the Water Corporation in Western Australia, for example, is attempting to move toward carbon-neutrality by reducing energy use and greenhouse gas emissions from its water treatment and wastewater treatment plants.²⁶

25 Dr Sophia Dimitriadis, 'Issues encountered in advancing Australia's water recycling schemes', *Parliamentary Library Research Brief*, Parliament of Australia, 16 August 2005, p. 27.

26 Dr Sophia Dimitriadis, 'Issues encountered in advancing Australia's water recycling schemes', *Parliamentary Library Research Brief*, Parliament of Australia, 16 August 2005, p. 27.

- 6.45 The committee stresses that one cannot be prescriptive at this stage and draws attention to the fact that what may work for one Australian city may not work for another. However, time is of the essence and a full and informed debate on the impact of wide-scale water recycling, desalination and other options in Australia's major cities needs to take place now.

Recommendation 13

- 6.46 **The committee recommends that the National Water Commission, in consultation with the States and Territories and the public, prepare an independent and transparent report on water options for each of the Australian capital cities and major regional centres.**

Water Efficiency Labelling and Standards Scheme

- 6.47 While water recycling and desalination certainly provide potential options for future water requirements, such options do not alleviate the growing need to reduce urban water consumption across Australia. Decreased usage is particularly necessary, given Australia's increasing population and predictions of more frequent extreme dry weather conditions as a result of climate change.
- 6.48 To aid this on a national scale, the Water Efficiency Labelling and Standards (WELS) Scheme was launched on 19 August 2004. WELS introduced national mandatory water efficiency labelling and minimum performance standards for a range of domestic water-using devices.
- 6.49 The aim of WELS is to encourage the uptake of water efficient products and appliances in domestic and commercial areas, while maintaining individual choice and accounting for regional variations in water supply in urban Australia.
- 6.50 The water-using products covered by WELS initially include showerheads, washing machines, dishwashers, toilets, taps, flow regulators and urinals. Mandatory labelling applies, except for flow regulators for which labelling will be optional. Once a product is registered under the scheme, compliance with the scheme is obligatory. In addition, a mandatory minimum standard applies to toilets. Further products are expected to be added to the scheme over time.

- 6.51 The feasibility phase of WELS included an assessment of how such a scheme would address the issue of high domestic water consumption by providing nationally consistent water efficiency information to consumers at point of purchase, and regulating manufacturers to stimulate design of more water efficient products.
- 6.52 The programme is drawing upon the experience of the mandatory energy efficiency labelling system in place across Australia, which has seen an energy efficiency improvement for refrigerators and freezers of 50 per cent over a 13 year period, and projected improvements of 70 per cent over 25 years. Similar improvements may be possible for some water using products over time.²⁷

Water appliance labelling

- 6.53 The Water Services Association of Australia made four observations about appliance labelling:
- Sydney Water's demand management and water efficient appliance retrofitting programme has resulted in reductions in water use by 20.9KL per household or approximately 10 per cent of household water use. This has been accompanied by reduced sewer flows, and fewer energy costs and greenhouse emissions.
 - Further demand management activities will require active intervention to improve information to customers on water efficiency of appliances and the Association strongly supports the initiative by the States and Federal Government for mandatory efficiency labelling of water using appliances.
 - The Association is working with a number of groups to establish a 'Smart Water Mark' scheme to label appliances that save water, but cannot be covered under the mandatory scheme, such as trigger hoses.
 - As consumers install newer appliances, the water efficiency of the household can improve. In the absence of consumer information on appliance water use, the rate of introduction of these more efficient appliances may be slowed.²⁸

27 Department of Environment and Heritage; see www.deh.gov.au/water/urban/scheme.html

28 Water Services Association of Australia, *Submission 149*, p. iii and p. 9.

- 6.54 The committee applauds the new water labelling initiatives. However, consumer market knowledge of the schemes appears limited and the committee is not aware of any major campaign to inform consumers of the schemes, particularly WELS. The committee believes that a public education/marketing campaign would help inform the public of WELS.²⁹

Recommendation 14

- 6.55 **The committee recommends that the Department of the Environment and Heritage undertake a public education campaign to increase community awareness of the Water Efficiency Labelling and Standards Scheme.**

Water efficiency for buildings

- 6.56 The committee was informed of a number of ways of increasing the water efficiency of buildings. Playford Council, for example, pointed out that stormwater can be retained in buildings and put to a number of uses, including landscape irrigation, toilet flushing, washing and drinking, but building practices are yet to implement these methodologies on large scale:

On a macro scale water is now retained in open space for purification and amenity purposes. Financial support for storm water and riparian management on a local and regional scale is strongly advocated.³⁰

- 6.57 However, there appears to be some progress; for example, new housing developments in areas of Sydney feature improved recycling and collection regulations, permitting the use of rainwater tanks to provide garden and lavatory water.³¹

- 6.58 According to the Committee for Sydney:

These new developments account for 30% of growth to the Sydney residential areas. The majority of new development is in existing urban areas. The cost of retrofitting established water and

29 See Mr Chris Davis, Australian Water Association, *Transcript of Evidence*, 29 April 2005, p. 35.

30 Playford Council, *Submission 57*, p. 2.

31 The Committee for Sydney, *Submission 151*, p. 8. The submission points out that the Rouse Hill residential development in Sydney incorporates 'a dual water system, including treated waste recycled water for gardens and lavatories in all new houses'.

sewerage systems to maximise recycled water use is significant. Commercial buildings have significant water requirements, but only a small proportion of the water needs to be drinking quality. Installation of treatment and recycling plants in all new commercial buildings requires serious consideration.³²

- 6.59 The committee agrees that new commercial buildings should be incorporating on-site water treatment and recycling. The committee suggests that peak industry bodies work more cooperatively to disseminate information on possible technologies and to promote their more widespread installation.

Water pricing

- 6.60 The committee believes that, despite currently available water saving technologies and other reforms, water consumption is unlikely to decrease significantly without appropriate and transparent water pricing. Australia's urban water prices are remarkably low; less than half of those in Europe for example, where rainfall is generally higher and more reliable. There is other research that supports such contentions.³³
- 6.61 The Department of Environment and Heritage explained to the Committee that a key objective of COAG's NWI is to implement best practice pricing, incorporating costs involved in water delivery and planning, and the environmental externalities associated with water extraction and water supply systems. This should encourage the adoption of more water-efficient technologies and practices.³⁴
- 6.62 The Roundtable Renewable and Sustainable Energy agrees:
- Price signals in the form of moving water pricing up to the cost of desalination and introducing a carbon credit scheme along with an embodied water trading scheme on a national level would ensure long term market transformations.³⁵

32 The Committee for Sydney, *Submission 151*, pp. 8-9.

33 See Port Jackson Partners Limited Report prepared for the Business Council of Australia, *Reforming and Restoring Australia's Infrastructure*, March 2005, p. 78. The Report contends that Sydney Water for example is not recovering any return for the value of the water itself: the low price of urban water is sufficient only to cover operating expenditure, depreciation and a financial return on the assets employed. According to the report, 'The water commodity is priced at zero; it should be priced at the cost of the next supply increment', p. 77, exhibit 55.

34 Department of Environment and Heritage, *Submission 157*, pp. 23-24.

35 Roundtable Renewable and Sustainable Energy, *Submission 117*, p. 16.; see also Engineers Australia, *Submission 103*, p. 5, Australian Water Association, *Submission 112*, p. 11.

- 6.63 It should be noted, however, that there are limitations to constraining urban demand by price increases alone. A study by the Victorian Essential Services Commission study concluded:

The overall elasticity of demand for water is generally regarded as being low, around -0.1 to -0.3, that is, a 10 per cent increase in price results in a 1 to 3 per cent reduction in total demand.³⁶

- 6.64 Nonetheless, the committee supports the Australian Government objective to establish better pricing mechanisms for water use.

Water sensitive urban design

- 6.65 Delfin Lend Lease explains that water sensitive urban design (WSUD) is:

... a more natural way of replicating the power of the natural system as a water cleansing and regulation agent. It considers treatment for the 'whole of catchment' not just individual development sites.³⁷

- 6.66 The International Council for Local Environmental Initiatives – Australia/New Zealand believes that local government has a significant role to play in influencing local communities to put in place land use policies that encourage WSUD.³⁸

- 6.67 A number of councils are active in this area. Brisbane City Council, for instance, lists community awareness, guidelines for WSUD private and public sector development activities, and development of publications to foster WSUD ideals as some of the cornerstones to its water management objectives.³⁹

- 6.68 According to the Australian Water Association, WSUD must be embraced and that developments that embrace WSUD principles are more sustainable than conventional ones. While such developments require more attention to detail, a well-conceived subdivision embodying WSUD concepts can be constructed more cheaply than a conventional design.⁴⁰

36 Essential Services Commission, *Water Price Review Vol 1: Metropolitan and Regional Businesses' Water Plans – Draft Decision 2005-2006 to 2007-2008*, p. 58, footnote 4.

37 Delfin Lend Lease, *Submission 66*, p. 15.

38 International Council for Local Environmental Initiatives – Australia/New Zealand, *Submission 72*, p. 8.

39 Brisbane City Council, *Submission 131*, p. 13.

40 Australian Water Association, *Submission 112*, p. 5.

- 6.69 The management and use of stormwater is a major part of WSUD. A number of submissions note the current wastage of potable water for the majority of household and industrial applications that do not require it. Australian cities require a 'more enlightened approach' that incorporates harvesting stormwater and restoring streams and canals to a more natural condition.⁴¹
- 6.70 The Australian Bicycle Council brings an additional perspective, by drawing attention to the current car dominated transport systems as a major source of water pollution, and further:
- The stormwater networks in some cities offer transport corridor opportunities for cycling and walking. Any reduction in the demand for road infrastructure can arrest the trend to pave even more urban surface area. The combination of roofs and roads direct an ever greater proportion of run-off into the stormwater systems, rather than to be absorbed in what remains of exposed earth and vegetation.⁴²
- 6.71 The committee takes note, however, of the point made by Mr Christopher Walsh that the focus on use of storm water:
- . . . should not be interpreted as an endorsement of the exploitation of all storm runoff (such that it perpetuates the often stated fallacy that large quantities of water flowing down a river to the sea are a waste of a precious resource). *Uses of stormwater runoff that export water from the catchment (e.g. through the sewerage system) will contribute to the continued degradation of waterways in urban areas.*⁴³
- 6.72 The evidence gathered by the committee demonstrates that in Australia today:
- water consumption, at 1540kl per capita per year (high by international comparison), is unsustainable;
 - potable water is used where other water could be used; and,
 - water is used once and then considered waste, creating a management issue.
- 6.73 The committee endorses the Government's policy of wise water use in which \$200 million over 5 years is being provided to reward a culture of wise water use.⁴⁴

41 STEP Inc., *Submission 87*, p. 7; see also Total Environment Centre, *Submission 42*, pp. 2-3.

42 Australian Bicycle Council, *Submission 70*, p. 6.

43 Mr Christopher J Walsh, *Submission 58*, p. 2 (author's emphasis).

44 *Environment Budget Overview 2005-06*, see www.deh.gov.au

- 6.74 WSUD is an important element in reducing water consumption and encouraging water reuse. The committee recommends that the Australian Government make sure that all research and development regarding water resource management takes into account WSUD principles.

Recommendation 15

- 6.75 **The committee recommends that the Australian Government ensure research and development regarding water resource management takes into account Water Sensitive Urban Design principles.**

Decentralised water delivery

- 6.76 With urban sprawl and the expansion of low density housing at city outskirts, cities of the future will undoubtedly exceed the existing capacity of surrounding water supplies and receiving waters.
- 6.77 It is clear that the characteristic approach of many large cities to water management (that is, piping in large water supplies and piping out equally large quantities of waste water), cannot be maintained as cities expand both geographically and in population. New water management methods are needed alongside changed settlement patterns.
- 6.78 Treated waste water and collected stormwater is traditionally discharged to the coast or waterways. This practice is detrimental to the marine or riparian environment, and represents a waste of what might otherwise be a valuable water resource.
- 6.79 With the development of more high density and transit-orientated urban villages, there is the potential to develop more localised, small scale systems of urban water treatment, including water harvesting, treatment and recycling.
- 6.80 The majority of Australia's water services are centralised. The CSIRO believes that the sustainability of Australia's water supply can be improved by providing water services at different scales, such as at the urban, sub-urban, local and individual property level.⁴⁵

45 CSIRO, *Submission 91*, p. 14.

- 6.81 One of the submissions received by the committee provided more information about the alternatives types of decentralised (or localised) water systems. Ms Sarah West explained that a decentralised sewerage system has five components:
1. household watertight interceptor tank (anaerobic or aerobic) with effluent filter
 2. primary treated effluent from the interceptor tanks is reticulated through small diameter watertight polyethylene pipes to the community treatment plant
 3. effluent pump in the interceptor tank where the house is below the main sewer line, otherwise gravity flow is utilized
 4. the community sewage treatment plant is a fixed substrate (sand, textile, foam or plastic) trickling filter plus Ultra-Violet disinfection
 5. treated effluent with a quality of <10 mg/L of BOD / TSS (Biochemical Oxygen Demand / Total Suspended Solids) is locally reused via sub-surface irrigation in gardens, parks, sporting fields, woodlots, agriculture and horticulture.⁴⁶
- 6.82 New standards would be required for some plumbing work and the ingredients in cleaning agents to make this a viable solution.⁴⁷
- 6.83 In its submission, Integrating Sustainability points to the link between more environmentally friendly and cheaper urban fringe developments and decentralised water management:
- The cost of service provision needs to be studied, as in many cities the cost of providing reticulated water and sewerage is cross-subsidized. This has meant that environmentally dubious developments on the urban fringe are being under-priced. If this situation were addressed it could provide an economic impetus to urban consolidation and encourage developments on the urban fringe to treat and reuse water on site.⁴⁸
- 6.84 The committee identifies a need for further research into the environmental and economic viability of more decentralised water management systems.

46 Ms Sarah West, Eco-Village Empowerment, *Submission 38*, pp. 1-2.

47 Ms Sarah West, Eco-Village Empowerment, *Submission 38*, p. 2.

48 Integrating Sustainability, *Submission 27*, p. 14.

Recommendation 16

- 6.85 **The committee recommends that the Australian Government commission research, either as part of the National Water Initiative or separately, to consider the economic viability and environmental benefits of decentralised water management systems.**
- 6.86 While every city's situation and water resources are different, all Australian cities are facing a growing water deficit as population growth drives demand and, most ominously, climate change causes a reduction in rainfall and a consequent much greater reduction in run-off. The committee was left in no doubt that several of our cities, especially Sydney and Perth, are in imminent danger of significant water shortages.