

Watersmart – developing a sustainable water resources strategy for Melbourne

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Abstract Melbourne's water supply system has developed incrementally since the 1850s in response to the demands placed on it by a growing city. As Melbourne has continued to grow, a number of water supply strategies have been undertaken to identify options for meeting future water demands. The last major strategy review was undertaken in 1992. In October 2000, the Victorian Government, through the Minister for Environment and Conservation, announced the establishment of a Committee to oversee the development of a sustainable 50 year water resource management strategy for Melbourne's water supply system. This paper outlines the process undertaken in developing the strategy, including; the development of the Discussion Starter report which provided background information on the four broad options identified to manage Melbourne's water resources, the consultation process adopted to obtain community views on preferences and the next steps in the development of the strategy.

Keywords Urban water cycle; water management; water resources planning; water resources strategy

Introduction

Melbourne's water supply system has developed since the 1850s. Throughout the history of the Melbourne system a number of water resource strategies, including parliamentary inquiries, have been undertaken to identify options for meeting the expected future water requirements of Melbourne. While early strategies were often supply sides driven, as the city has grown and prospered more recent strategies have considered both supply side and demand side management options. Greater attention is now being directed at resource management at the broader catchment and system level, and the interactions between strategic options and other water management options such as alternative supplies such as rainwater tanks and the reuse of greywater and water sensitive urban design. Further attention is also being directed at ensuring community involvement in the development of long term sustainable strategies for managing water resources, so that the final strategy is owned by the community.

This paper sets out the process and issues involved in developing the sustainable water resources strategy for Melbourne, including:

- The process undertaken to develop the strategy, including the development of the Discussion Starter Report, the Draft Strategy Options Report and the final Strategy Report.
- The issues covered in the Discussion Starter report, including consideration of the four broad options to manage Melbourne's water resources to meet the water needs of a vibrant and growing city
- The consultation process adopted to obtain community and stakeholder views on the options to manage Melbourne's water resources
- The studies undertaken to provide further information to assist in the development of the draft strategy options

Up to date information on the strategy development will be made available at the conference.

Melbourne's water supply system

The Melbourne water industry is wholly owned by the Victorian Government and was disaggregated in 1995 into a wholesale and retail model. Melbourne Water provides wholesale water and sewerage services to three retail water companies – City West Water Ltd, South East Water Ltd, and Yarra Valley Water Ltd. Melbourne Water also provides supplies to Gippsland Water, Southern Rural Water and Western Water. Bulk Water Supply Agreements define Melbourne Water's delivery requirements at various customer interface points and each of the retail water companies have license obligations to provide water and sewerage services within defined areas. The Melbourne water supply system provides water to a population of some 3.4 Million people.

Key characteristics defining Melbourne's water supply system are:

- Catchment characteristics. Approximately 90% of Melbourne's water comes from uninhabited and restricted access catchment areas. Water from these catchments is predominantly unfiltered and requires only minimal treatment before distribution to customers. Melbourne is believed to be one of a few major cities in the world that have such catchment areas. Approximately 50% of Melbourne's forested catchment areas, are covered principally by Mountain Ash (*Eucalyptus regnans*). Forest hydrology research on Mountain Ash catchments has shown that catchment yields can be reduced by up to 50% from old growth forests 20 to 40 years after disturbance by bushfire or logging activity (Vertessy *et al.*, 1998).

Around 10% of the catchment area is subject to human and agricultural activity. This area, upstream of Yering Gorge in the Yarra Valley is largely used for agricultural and viticultural purposes and presents management challenges in maintaining the quality and quantity of water from these areas in the long-term.

- Storage System and Capacities. The Melbourne supply system has a live storage capacity to a total 1,787,500 ML. A major advantage of these storages is the ability to transfer and distribute water by gravity. The Thomson reservoir represents approximately 60% of the total storage capacity of the Melbourne system. The useable storage capacity (1,068,000 ML) is approximately four times the mean annual inflow to the reservoir. The relationship of capacity to inflow for this reservoir means that the storage has significant multi-year carryover storage.
- Growth in demand for water is the principal driver for water resources development. From about 1910 to the mid 1980s a 2.9% p.a. growth rate was observed for Melbourne. Since the mid 1980s, demand management practices, including pricing reform and the greater use of dual flush toilets, has assisted in reducing overall growth rates to currently less than 1% per annum. Further lowering of growth rates by the greater adoption of additional demand management practices, and changed household water usage patterns have significant potential to further delay the requirement for additional water resource requirements for Melbourne.

Development of the WaterSmart strategy

The last major water resources review for Melbourne was undertaken in 1992. In October 2000, the Victorian Government, through the Minister for Environment and Conservation, the Hon. Sherryl Garbutt, MP, established a committee to overview the development of a sustainable water resources management strategy for Melbourne's water supply.

The Water Resources Strategy Committee represents a broad range of interests in water resource management, including the water industry, environmental, local government, academic, community and social interests and is chaired by Emeritus Professor Nancy Millis from the University of Melbourne.

A Project Management Group and an Industry Working Group support the Committee.

These groups are comprised of senior representatives from Melbourne Water, the metropolitan retail water companies City West Water, South East Water, Yarra Valley Water and the Department of Natural Resources and Environment.

The objective of the strategy is to provide a long-term framework for managing Melbourne's water resources in a way that is cost effective, environmentally sustainable and responsive to community needs. The strategy development includes an open consultation process involving relevant stakeholders and the community.

The process of developing the strategy features three main stages (see Figure 1):

- A Discussion Starter.
- The development of a Strategy Options Report.
- A Recommended Strategy.

At the time of writing the Strategy Options Report is currently being developed.

The Discussion Starter

The Discussion Starter was released on 17 June 2001, and marked the commencement of a two month period of community consultation. The Discussion Starter was prepared to provide basic and important information about Melbourne's water resources to help identify the key issues, and to assist the process of dialogue and debate in the first phase of community and stakeholder consultation.

The Discussion Starter report covers a range of issues concerning the management of Melbourne's water resources. This report covers Melbourne's water use within the state-wide context, water industry structure and regulation, a description of Melbourne's supply system, the source of Melbourne's water, water use attitudes and behaviours, climate variability and change and the issue of sustainability for water supply systems. The Discussion Starter proposed a four-pronged framework for sustainable water resource management, namely:

- Harvesting more water from the existing supply system. A range of options were presented including water restrictions, savings in non-revenue water and supply augmentation options within existing catchment areas.

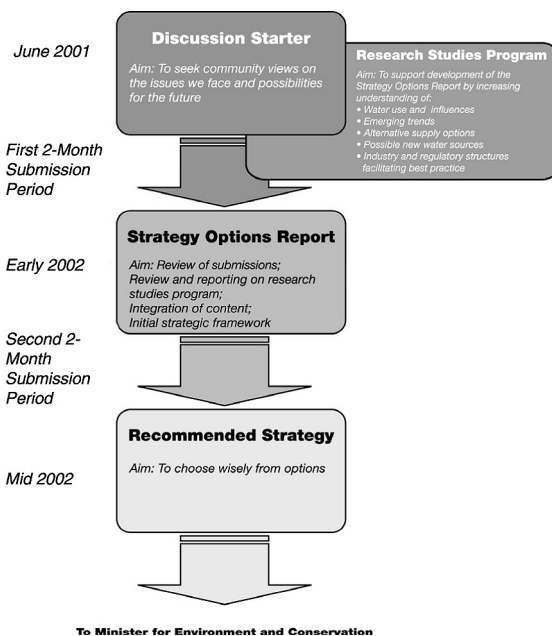


Figure 1 WaterSmart strategy process

- Changing the behaviour of water users to reduce demand and provide capacity for population growth.
- Reducing demand for potable water from the current supply system by substituting recycled water and alternative water supplies.
- Further developing the system to increase capacity of supply through accessing of new water sources.

A key element in the development of the Strategy is the involvement of the community and stakeholders. The Strategy consultation process has made extensive use of a website and a Customer Service Centre to provide information and receive submissions. A number of meetings and presentations have also taken place with key stakeholders and professional groups.

The dedicated WaterSmart website (www.watersmart.vic.gov.au) was established to provide general information covered within the Discussion Starter. The website provided the opportunity to download the Discussion Starter and to make and view the submissions online. Written submissions were scanned and uploaded to the website for general community viewing under key themes and may be viewed on the “Make a Submission” page of the site.

The Department of Natural Resources and Environment Customer Service Centre managed general phone enquiries on the Strategy. Short verbal submissions were also taken on a message recording service provided by the Customer Service Centre which were then transcribed and uploaded to the website for general viewing. Requests for detailed or technical information that were unable to be dealt with by the Customer Service Centre were referred to Industry Working Group representatives.

A multi-lingual brochure for non-English speaking community groups was also prepared to encourage broader community access and involvement in the consideration of the strategy issues.

Given the range of methods for receiving submissions a process was established to manage the submissions through the different media. The establishment of this process involved close communication with managers of the web site and Customer Service Centre and included development of a database to summarise and analyse the range of submissions.

Discussion starter submissions

Submissions to the WaterSmart Strategy were made from the period 17 June to the 30 August 2001. By the close of submissions, over 3,700 visits to the web site were recorded, and over 300 submissions were received. Submissions were received through the following means:

- 31% of submissions were received through the WaterSmart website.
- Written submissions comprised 54% of submissions received.
- Recorded messages taken through the WaterSmart call centre accounted for 15% of the submissions.

All of the submissions were summarised in a separate database to assist in their analysis. The database enabled individual submissions to be further categorised under key submission areas described within the Discussion Starter. The key categories under which submissions were made are based on the issues covered in the Discussion Starter. Figure 2 summarises the number of submissions received on key categories.

The main areas covered by the submissions varied with their form. In general, the written submissions addressed a broader range of issues, were more detailed, and represented a wider range of stakeholders than those received via electronic means or through the Customer Service Centre. Issues relating to pricing formed the largest issues of discussion in the written submissions.

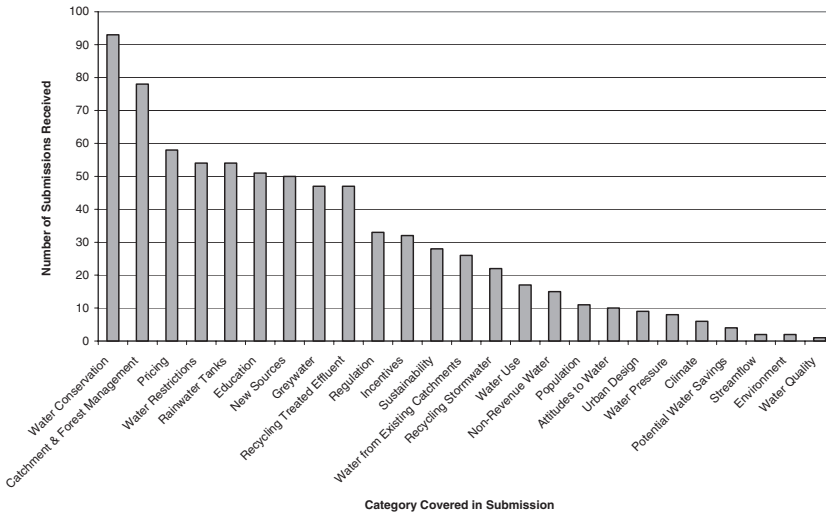


Figure 2 Number of submissions received on key categories

The largest number of submissions made through electronic means related to catchment and forest management with a relatively even spread across other categories. Submissions received via the Customer Service Centre were shorter and tended to focus on water conservation options.

Studies and seminars

To provide additional information in support of the development of the Strategy Options Report, a number of studies were undertaken and a seminar was conducted. The studies were managed by the organisations represented on the Project Management Group.

- Customer Values and Preferences Study. This study involved 601 telephone interviews as a “top of mind” survey to explore peoples preferences for the broad options being considered in the Strategy, and was undertaken by Newton Wayman Chong for City West Water. The survey indicated strong community support for reducing water demand ahead of other options. However, community response indicated that a mix of options is desirable, involving, in order of preference, alternative supply options, the development of new water sources and increased water harvesting from the current supply system.
- Water End Use Study. The aim of this study was to understand how water is used within the community and the factors influencing water consumption. The study was undertaken by CSIRO and the Institute for Sustainable Futures for Yarra Valley Water.
- Institutional and Regulatory Arrangements. This study was undertaken for DNRE by consultants NERA and focussed on institutional mechanisms assisting water conservation including demand management, incentives restrictions and decision methods.
- Alternative Supply Options. This study involved an assessment of alternative supply options and the water volumes available for alternative local water cycle management developments. The study was undertaken by the Institute for Sustainable Futures (ISF) of the University of Technology Sydney and CSIRO, and managed by South East Water.
- Water Supply System Yield Assessment. The project was undertaken and managed by Melbourne Water and was comprised of an assessment of the water supply system yield and a review of the yield assessment methodology by an expert panel.
- New Water Source Options. While there are no plans to develop new water sources outside current catchment areas, prudent resources planning requires consideration of the issues associated with accessing new sources given the implications for other water

users and the environment. Sensitivity surrounding population forecasts and housing types and use into the future, and possible climate change effects on catchment runoff and water demands, make prediction of demand over 50 years into the future an imprecise science. This uncertainty highlights the need to consider options and issues involving new water sources.

A study was undertaken by Sinclair Knight Merz and managed by Melbourne Water to consider the issues associated with accessing new water sources. The study identified a number of issues and barriers in relation to accessing new water including: the Murray-Darling Basin cap and its implications for water trading, the potential for increased environmental flows and the implications of this on water availability, legislative and social issues associated with water trading.

- **Local and Domestic Water Recycling Seminar.** A large number of submissions to the strategy dealt with rainwater tanks and water recycling, particularly greywater reuse. As a result of this interest a seminar was held to bring together experts and stakeholders from across Australia to discuss alternatives to conventional water and sewerage servicing (water sensitive urban design, greywater reuse, rainwater tanks, reuse of treated effluent and reuse of stormwater) as well as methods adopted to reduce demand.

The findings from these studies and the Seminar will be incorporated into the development of the Strategy Options Report.

Next steps

Work is proceeding on the development of the Strategy Options Report. At the time of writing the structure of the report and the strategy options to be considered have not been finalised. Further information will be available at the Conference.

However, at this stage the focus of the report is expected to be on the range of possible options to both reduce demand and increase supply in the long term with consideration of the broader implications of the suggested options on water cycle management.

Of particular concern to the Committee is the need to develop a strategy based on an equitable set of management options that target all user groups, including Industrial, Commercial and Institutional (ICI) users as well as domestic users. The Committee is also committed to consider all options within a triple bottom line assessment framework that takes account of environmental, economic and social implications of the strategic options.

Scenarios for water demand and options to manage demand are under consideration. The options currently being considered include one involving a lower population scenario in 2050 with mild demand management options, and another involving a higher population scenario and a tougher set of demand management options. In both cases, actions that provide for water savings across all urban water uses are being considered. Options identified as part of the studies offering future potential in reducing water demand and the growth rate in water demand include:

- Water appliances and fixtures, including greater adoption of AAA rated shower heads and front-loading washing machines. While past water use studies have often focussed on outdoor water use, opportunities also exist to reduce in-house water use through education, incentives and regulation.
- Water sensitive urban design in new developments.
- Increased water use efficiency in Industry, Commercial and Institutional (ICI) use. ICI represents around 28% of Melbourne's water use and has tended to be overlooked in many previous demand management studies.
- Use of rainwater tanks to supplement garden watering and toilet flushing.

A detailed Strategy Options Report covering the possible options for the long term management of Melbourne's water resources will be prepared for community consultation in

early 2002. After a period of community and stakeholder consultation on the strategy options a final report will be prepared for the Minister for Conservation and Environment in mid 2002.

Conclusion

The paper has highlighted the background and process and some significant issues in the development of the WaterSmart strategy. The foresight of past decisions will continue to benefit future Melburnians, particularly with respect to catchment policy and water resource developments. However, the development of the strategy is concerned with meeting the growing demand within the constraints of system hydrology, system configuration and minimising environmental impacts.

The challenge in developing the Strategy is to maximise the benefits associated with the existing system by managing long term water demand growth through water conservation and alternative supply options such as recycling and water sensitive urban design. The changing of community attitudes and behaviour to water use and reconciliation of the concepts of sustainability given continued population growth will be key issues being considered in the development of the strategy.

Acknowledgement

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