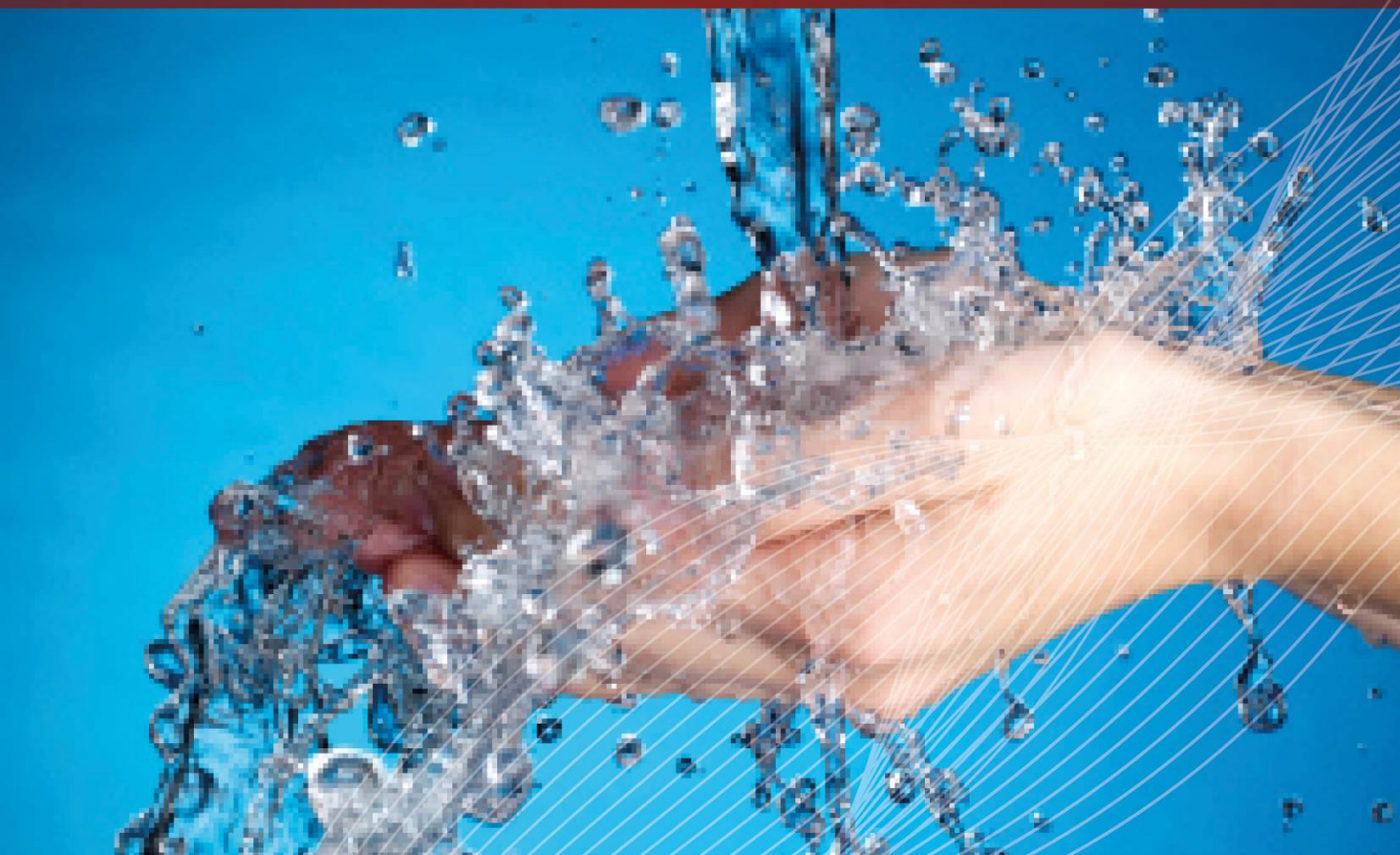
Australian Water Recycling
Centre of Excellence

Project Report
Water Recycling and the Public: Guidelines for Community Engagement

A report of a study funded by the
Australian Water Recycling Centre of Excellence

M. Kearnes and J. Motion, December 2014



Water Recycling and the Public: Guidelines for Community Engagement

This report has been prepared as part of the National Demonstration Education and Engagement Program (NDEEP). This Program has developed a suite of high quality, evidence-based information, tools and engagement strategies that can be used by the water industry when considering water recycling for drinking purposes. The products are fully integrated and can be used at different phases of project development commencing at "just thinking about water recycling for drinking water purposes as an option" to "nearly implemented".

Project Leader

Dr Matthew Kearnes
School of Humanities and Languages
Faculty of Arts and Social Sciences
UNSW
Sydney, NSW 2052 AUSTRALIA

Phone: +61 2 9385 1010

Contact: Matthew Kearnes m.kearnes@unsw.edu.au

About the Australian Water Recycling Centre of Excellence

The mission of the Australian Water Recycling Centre of Excellence is to enhance management and use of water recycling through industry partnerships, build capacity and capability within the recycled water industry, and promote water recycling as a socially, environmentally and economically sustainable option for future water security.

The Australian Government has provided $20 million to the Centre through its National Urban Water and Desalination Plan to support applied research and development projects which meet water recycling challenges for Australia's irrigation, urban development, food processing, heavy industry and water utility sectors. This funding has levered an additional $40 million investment from more than 80 private and public organisations, in Australia and overseas.

ISBN: 978-1-922202-26-0

Citation:
Kearnes, M. and Motion, J. (2014). *Water Recycling and the Public: Guidelines for Community Engagement*. Report of the National Demonstration, Education and Engagement Program, Australian Water Recycling Centre of Excellence, Brisbane, Australia.

Date of publication: December 2014

Publisher:
Australian Water Recycling Centre of Excellence
Level 5, 200 Creek St, Brisbane, Queensland 4000
www.australianwaterrecycling.com.au

This report was funded by the Australian Water Recycling Centre of Excellence through the Australian Government's National Urban Water and Desalination Plan.

Water Recycling and the Public:
Guidelines for Community Engagement

Matthew Kearnes and Judy Motion

National Demonstration, Education and Engagement Program

UNSW AUSTRALIA | Arts & Social Sciences

Australian Water Recycling Centre of Excellence

Purpose of the Document

This document provides guidance on community engagement practice and strategies in the area of potable reuse. This guidance document draws on and is underpinned by the results of a three-year study of public understandings and responses to potable reuse conducted as part of Stream 2.2 of the National Demonstration, Education & Engagement Program (NDEEP). [1]

This document is designed to provide overarching strategic guidance that may be adapted in different organisational and institutional settings.

These guidelines were developed by UNSW researchers Dr. Matthew Kearnes and Prof. Judy Motion in collaboration with Weber-Shandwick, one of Australia's leading public relations agencies.

Project Description

The NDEEP project is designed to develop a National Demonstration Education and Engagement Program for recycled water to be viewed as an acceptable alternative for augmenting drinking water supplies.

Led by the University of New South Wales, the project involves a consortium of organisations from Australia and overseas, including water utilities, universities and private companies. The project has also developed tools, methods and materials which provide consistent and relevant information across Australia, to aid in increasing community understanding and acceptance of water reuse as an alternative drinking water supply.

To cite these guidelines please use the following citation:

Kearnes, M. and Motion, J. (2014). *Water Recycling and the Public: Guidelines for Community Engagement.* Report of the National Demonstration, Education and Engagement Program, Australian Water Recycling Centre of Excellence, Brisbane, Australia.

ISBN: 978-1-922202-26-0

[1] For reference please see: M Kearnes, J Motion, and J Beckett, *Australian Water Futures: Rethinking Community Engagement* (Report of the National Demonstration, Education & Engagement Program, University of New South Wales, 2014).

Executive Summary

This document provides guidelines for the development of community engagement initiatives focused on the proposed use of recycled water for drinking.

The term community engagement captures a broad range of practices and initiatives through which the general public and other stakeholders are invited to participate in and contribute to significant policy, planning and decision-making processes.

We suggest that community engagement practices can take a variety of forms, and successful strategies will typically employ a variety of techniques that offer a range of avenues for participation and engagement.

In the following sections of these guidelines we review current practice in community engagement and outline a series of principles that underpin the design of successful public participation initiatives.

These include:

1. Using community engagement practices to co-establish a set of commonly agreed values in the design of water recycling initiatives;

2. Developing timely interventions, with open issue framings, so that community engagement processes have the capacity to influence policy outcomes;

3. Developing community engagement processes that generate public discussion and consideration of water sustainability and security issues, enabling broad public consensus on possible responses; and

4. Ensuring that community engagement processes are embedded within planning and approval processes and have internal institutional buy-in.

In the final section of the guidelines we outline community engagement and consolation strategies appropriate in the Pre-Approval/Approval, Trial and Implementation phases of water recycling projects.

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Section 1: Introduction

This document provides guidelines for the development of community engagement initiatives focused on the proposed use of recycled water for drinking. These guidelines are prepared for community engagement specialists planners working for water agencies or utilities.

These guidelines are underpinned by research conducted for the Australian Water Recycling Centre of Excellence's National Demonstration, Education and Engagement Program (NDEEP), and in particular a three-year study of public understandings and responses to drinking water produced from recycling schemes.[2] This research suggests that the proposed use of recycled water for drinking is likely to remain contentious within the Australian community over the coming years. The results of our research highlight the need to develop new ways of engaging the general public in processes of water planning and decision-making, and to build engagement strategies that enable broad public participation in the consideration of Australian water futures.[3]

These guidelines are designed to build on and extend existing institutional and corporate engagement practices. However, in the following sections we suggest that current approaches have tended to focus primarily on issues of public trust and acceptance and have been deployed relatively late in planning processes, when decisions about the construction of new water infrastructures have already been taken. We suggest that this approach has limited the scope for meaningful public participation in decision-making and, as we outline in our research, has contributed to public concerns about the adequacy of planning processes around alternative water source projects.[4]

While the implementation of potable reuse schemes in Australia has met with limited success to date, we suggest that opening up community engagement practices to new methods and approaches represents an historic opportunity to recast the relationship between water planning processes and the Australian public, seeing the future of Australian water supplies as a social and democratic issue rather than simply a technological challenge.[5]

In the following sections of these guidelines we identify a series of key challenges that we draw from our research, and outline a set of principles for the design of long-term and ongoing engagement initiatives.

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[2] For further background on the NDEEP, including research findings from across the project, please refer to the project website.

[3] Kearnes, Motion, and Beckett, *Australian Water Futures: Rethinking Community Engagement.*

[4] See also J Mackenzie, "Watered down: the role of public participation in Australian water governance," *Social Alternatives* 27, no. 3 (2008), S Russell, C Lux, and G Hampton, "Beyond "Information": Integrating Consultation and Education for Water Recycling Initiatives," *Society & Natural Resources: An International Journal* 22, no. 1 (2008), N Stenekes et al., "Risk and Governance in Water Recycling: Public Acceptance Revisited," *Science Technology and Human Values* 31, no. 2 (2006).

[5] J Arvanitakis and B Brown, "Scarce Water and the Australian Progress Trap: a commentary," in *Remapping the Future: History, Culture and Environment in Australia and India* ed. R Frances and D. N Bandyopadhyay (Newcastle upon Tyne: Cambridge Scholars Publishing, 2013), P Troy, ed., *Troubled Waters: Confronting the Water Crisis in Australia's Cities* (Canberra: ANU E-Press, 2008).

Section 2: Defining Community Engagement

The term community engagement captures a broad range of practices and initiatives through which the general public and other stakeholders are invited to participate in and contribute to significant policy, planning and decision-making processes.

Public participation in urban and environmental planning has a long history, and the principles of community engagement were most succinctly articulated in the 1992 Rio Declaration on Environment and Development. Principle 10 of the Rio Declaration suggested that 'environmental issues are best handled with participation of all concerned citizens, at the relevant level' and spoke of the need for citizens to have 'access to information concerning the environment … and the opportunity to participate in decision-making processes'.[1]

Building on this definition, the involvement of members of the public in policy-making – particularly in areas where members of the public are affected by or have a direct stake in decision-making – is commonly regarded as a hallmark of sustainable development. As a consequence of the Rio Declaration and subsequent policy discussions concerning sustainable development, over the last 25 years we have witnessed a broad transformation in institutional communication practices with an emphasis on direct public participation in decision-making supplementing traditional modes of information provision and risk communication.[2]

Defining Community Engagement

How then should we define community engagement? In recent academic and policy literatures it is common to distinguish uni-directional decision-making processes – often referred to as the 'Decide, Announce, Defend model' (DAD) (see Figure 1) – from multi-directional and deliberative models of public and stakeholder engagement (see Figure 2).

The DAD model is characterised by:

1. Planning processes where the nature of policy problems and possible responses remains separated from processes of public consultation and institutional communication. In this model public and community engagement practices are employed to generate acceptance of predetermined policy outcomes and approaches;

2. Approaches that conceptualise public opinion – and particularly expressions of public concern – as an obstacle to be overcome through effective and targeted communication strategies underpinned by research on public attitudes and preferences;

3. Relatively brittle decision-making processes that remain vulnerable to community concern and controversy, that lack broad social legitimacy, and that have little capacity for institutional learning and innovation.[3]

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[1] UNEP, *Rio Declaration on Environment and Development* (United Nations Environment Programme, 1992).

[2] J Chilvers and M Kearnes, eds., *Remaking Participation: Science, Environment and Emergent Publics* (London: Routledge, 2015), A Irwin and B Wynne, *Misunderstanding Science? The Public Reconstruction of Science and Technology* (Cambridge and New York: Cambridge University Press, 2000).

[3] PlanningNSW, *Community Engagement In The NSW Planning System* (Sydney: NSW Department of Local Government, 2003), Queensland Government Department of Communities, *Engaging Queenslanders: A Guide to Community Engagement Methods and Techniques* (Brisbane: Queensland Government Department of Communities, 2007).

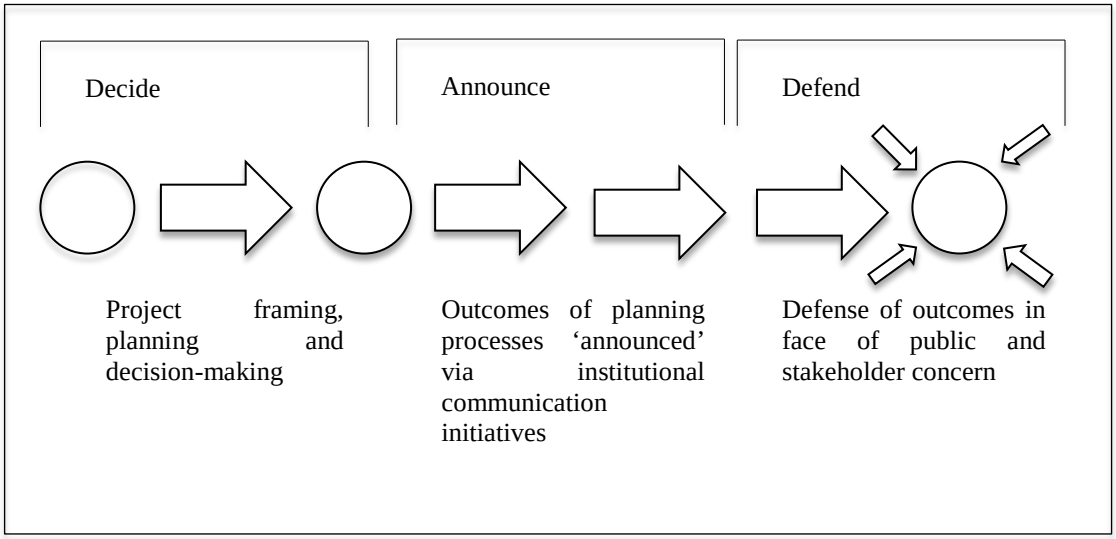

Figure 1: The linear Decide-Announce-Defend (DAD) model

In contrast to this relatively linear model, it is now commonly accepted that socially robust policy-making, and environmental decision-making, entails multidimensional forms of collaboration and deliberation.[4] In this context, engagement processes that seek to draw on a diverse range of perspectives – both public and stakeholder – in understanding and characterising the nature of policy problems and collectively defining possible responses are critical to policy-making processes (see Figure 2).

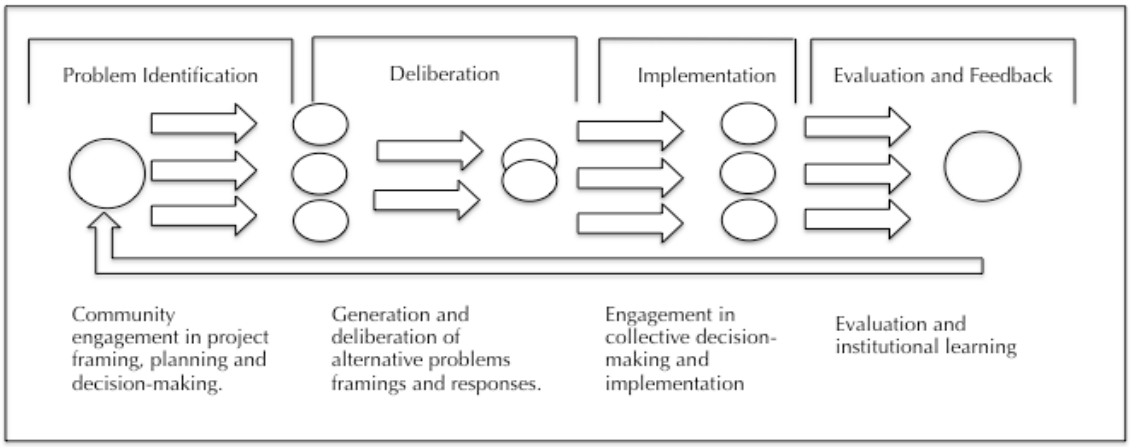

Figure 2: Multi-dimensional policy and community engagement processes

Community engagement practices in this context are characterised by the following features:

1. In place of the relatively constrained communication of policy outcomes, practices of community engagement are utilised in early stages of policy and planning processes. Here the goal is to incorporate alternative understandings of the nature of the policy problem and to generate diversity in possible responses;

[4] M. A Hajer and H Wagenaar, eds., *Deliberative Policy Analysis: Understanding Governance in the Network Society* (Cambridge: Cambridge University Press, 2003), F Fischer, *Reframing Public Policy: Discursive Politics and Deliberative Practices: Discursive Politics and Deliberative Practices* (Oxford: Oxford University Press, 2003), J S Dryzek, *Deliberative Democracy and Beyond: Liberals, Critics, Contestations* (Oxford: Oxford University Press, 2000).

2. In contrast to the DAD model which tends to restrict discussion to single policy prescriptions, community engagement practices have a pluralising effect on decision-making processes, generating a range of possible responses and engaging in deliberative processes in the design and implementation of approaches; and

3. Community engagement practices are commonly designed to include structured processes of institutional learning and evaluation.

Moving from the relatively linear DAD model toward more deliberative and participatory planning processes entails a shift in the purposes and design of community engagement practices. As we will outline below, in the area of water recycling it will be critical to embed community engagement practices in water planning processes. In moving beyond communication approaches that primarily rely on risk communication around prefigured infrastructure schemes, community engagement practices should be designed to include a range of alternative perspectives in considering water scarcity and security issues, and should seek to create avenues for broad-based public participation in decision-making. The aim of community engagement initiatives around water recycling should be to incorporate public participation much earlier in planning processes, focusing on generating public discussion and consideration of water scarcity, rather than simply motivating acceptance of technological responses.

Inform – Consult – Engage

Community engagement practices can take a variety of forms, and successful strategies will typically employ a variety of techniques that offer a range of avenues for participation and engagement.

Academic and policy literatures have tended to distinguish between 'consultative' and 'participatory' forms of community engagement:

1. *Public Consultation*: is defined by practices that seek to generate public input into decision-making, and is typically accompanied by research concerning the views, attitudes and preferences of stakeholders and the general public.

2. *Public Participation*: is defined by community engagement practices that are designed to offer the general public a more active role in considering policy options and influencing outcomes.

In practice we suggest that community engagement practices around water security will tend to adopt both consultative and participatory strategies.

One common way of categorising this diverse array of practices and strategies is the degree of active public participation in decision-making. For example, the Organisation for Economic Cooperation and Development (OECD) distinguishes between three forms of engagement practice: 'information', 'consultation' and 'active participation' (see Figure 3).

Figure 3: OECD Community Engagement Model (Source: Engaging Queenslanders: A Guide to Community Engagement Methods and Techniques, Queensland Government Department of Communities, 2007)

The International Association for Public Participation (IAP2) – a non-profit, civil society organisation engaged in developing best-practice public participation – categorises engagement strategies in a similar way, distinguishing forms of engagement practice: 'inform', 'consult', 'involve', 'collaborate' and 'empower' (see Figure 4).

Increasing Level of Public Impact

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problems, alternatives and/or solutions.	To obtain public feedback on analysis, alternatives and/or decision.	To work directly with the public throughout the process to ensure that public issues and concerns are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and issues are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for direct advice and innovation in formulating solutions and incorporate your advise and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
EXAMPLE TOOLS	• Fact sheets • Websites • Open houses	• Public comment • Focus groups • Surveys • Public meetings	• Workshops • Deliberate polling	• Citizen Advisory committees • Consensus-building • Participatory decision-making	• Citizen juries • Ballots • Delegated decisions

Figure 4: IAP2 Public Participation Spectrum (Source: www.iap2.org.au)

While the community engagement practices across the water sector have tended toward the 'Inform' end of the IAP2 spectrum – largely through the use of market segmentation and the targeted messaging of institutional communication initiatives – in recent years a range of public bodies have made commitments to implement more participatory models of public engagement in water planning.

With reference to the IAP2 model, the Western Australian Department of Environment and Conservation recently indicated its commitment to 'integrate, in a meaningful way, the knowledge and opinions of others into its decision-making processes' to 'understand community and stakeholder views and consider these to create better project and policy outcomes' and to foster 'a long-term view of relationship-building with stakeholders and communities, built on trust, and which benefits all parties'.[5]

In Victoria the Department of Sustainability and Environment has indicated a commitment on the part of the State Government to develop a 'genuinely democratic government' and to 'place a greater emphasis on establishing a true democratic partnership between the people and their institutions'.[6]

Finally, in NSW recent initiatives by the Metropolitan Water Directorate established a set of community planning principles that underpinned public input and participation in the *2010 Metropolitan Water Plan* and the 2014 Lower Hunter Water Plan.[7]

In this context the potential benefits of more interactive and participatory forms of community engagement, for both communities and institutions, are increasingly being recognised.

For communities, these benefits include:

- The capacity to directly contribute to the identification and framing of policy priorities and shaping outcomes that broadly align with community values;

- Developing a sense of shared ownership and inclusion in decision-making processes and the implementation of collectively defined policy outcomes;

- Helping to ensure a diversity of perspectives and voices are heard in planning processes; and

- Fostering mechanisms of proactive community empowerment, social capital and cohesion.

For government and institutions these benefits include:

- Participatory forms of community engagement can help to improve processes of policy-making and planning by introducing fresh perspectives, and by ensuring decision-making aligns with community values and understandings;

- By developing more interactive and long-term relationships with the community, institutions are also able to develop collaborative partnerships, which foster more open and transparent forms of negotiation and discussion; and

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[5] Department of Environment and Conservation, *Policy Statement: Public Participation and Stakeholder Engagement* (Government of Western Australia, Department of Environment and Conservation, 2011), 1.

[6] Department of Sustainability and Environment, *Effective Engagement: Building Relationships With Community and Other Stakeholders - Book 1, An Introduction to Engagement* (State of Victoria, Department of Sustainability and Environment, 2005), 6.

[7] Metropolitan Water Directorate, *Lower Hunter Water Plan* (Sydney: Metropolitan Water Directorate, New South Wales Department of Finance and Services, 2014), NSW Office of Water, *Metropolitan Water Plan: Water For People and Water for the Environment* (NSW Office of Water, The Department of Environment, Climate Change and Water, 2010).

- Effective community engagement strategies also enable institutions to develop anticipatory understandings of possible public concerns and to respond proactively.

Current Community Engagement Practices

In our research we found that commitments to participatory forms of policy making have been applied relatively inconsistently.[8] As we outline in the accompanying report – *Australian Water Futures: Rethinking Community Engagement* – though potable reuse remains politically sensitive in many locations throughout Australia, at a national level there is emerging policy consensus that water recycling should be assessed on its merits as a viable alternative for bulk water supply. This policy consensus has tended to present the challenge to the implementation of water recycling initiatives primarily as one of public acceptance of drinking recycled water, and issues of community acceptance and adverse public reactions are presented as barriers to be overcome through targeted information provision and consultation initiatives.

In the accompanying research report we suggest that issues around water scarcity and supply have been thought about primarily as technical issues with limited scope for collective public participation on the nature of the problem itself.[9] While it is common to suggest that public and community participation will be critical to the success of potable reuse schemes, it is clear in our research that community engagement initiatives have been deployed in the implementation phase of water recycling schemes, rather than in planning processes. This has meant that community engagement initiatives around recycled water have tended to toward the 'Inform' side of the IAP2 spectrum, focused on providing publicly accessible information regarding the technical feasibility, reliability and safety of water recycling technologies, but with limited capacity to involve communities in more meaningful considerations of recycled water.

Our research suggests that the key challenge in the area of recycled water is building community engagement initiatives that incorporate broad public participation at earlier phases of project consideration and design. Critical to the success of community engagement strategies will be ensuring that such initiatives are integrated into planning processes, and maintaining public participation in decision-making as projects mature toward the construction and implementation phases.

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[8] Kearnes, Motion, and Beckett, *Australian Water Futures: Rethinking Community Engagement.*

[9] R. P Lejano and C Leong, "A Hermeneutic Approach to Explaining and Understanding Public Controversies " *JPART* 22 (2012), S. Bell and V Aitken, "The socio-technology of indirect potable water reuse," *Water Science & Technology: Water Supply* 4, no. 441–448 (2008), Russell, Lux, and Hampton, "Beyond "Information": Integrating Consultation and Education for Water Recycling Initiatives."

Section 3. Principles of Community Engagement

Across the public and community engagement sector a series of core values and principles have been identified as critical to the success of public participation practice.

The International Association for Public Participation (IAP2) has outlined six core values for community engagement. These include:

1. Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process;

2. Public participation includes the promise that the public's contribution will influence the decision;

3. Public participation promotes sustainable decisions by recognising and communicating the needs and interests of all participants, including decision makers;

4. Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision;

5. Public participation seeks input from participants in designing how they participate;

6. Public participation provides participants with the information they need to participate in a meaningful way; and

7. Public participation communicates to participants how their input affected the decision.[1]

At the heart of these values is a commitment on the part of governments, regulatory agencies and institutions to ensure that communities and members of the public that are affected by decision-making processes have a voice in policy-making processes and the implementation of outcomes.

In addition, a core component of this commitment to public participation is ensuring that engagement processes are themselves transparent, with well-formulated goals and objectives, meaningful information and effective feedback mechanisms that indicate how citizen involvement in decision-making has influenced decision-making.

In a recent OECD review of participatory processes across its member states, the OECD identified a more extensive set of values and guiding principles in effective community engagement practice. These include:

1. **Commitment**: Leadership and strong commitment to open and inclusive policy-making is needed at all levels – politicians, senior managers and public officials.

2. **Rights**: Citizens' rights to information, consultation and public participation in policy making and service delivery must be firmly grounded in law or policy. Government

[1] IAP2 Core Values: www.iap2.org.au/about-us/about/core-values

obligations to respond to citizens must be clearly stated. Independent oversight arrangements are essential to enforcing these rights.

3. **Clarity**: Objectives for, and limits to, information, consultation and public participation should be well defined from the outset. The roles and responsibilities of all parties must be clear. Government information should be complete, objective, reliable, relevant, and easy to find and understand.

4. **Time**: Public engagement should be undertaken as early in the policy process as possible to allow a greater range of solutions and to raise the chances of successful implementation. Adequate time must be available for consultation and participation to be effective.

5. **Inclusion**: All citizens should have equal opportunities and multiple channels to access information, be consulted and participate. Every reasonable effort should be made to engage with as wide a variety of people as possible.

6. **Resources**: Adequate financial, human and technical resources are needed for effective public information, consultation and participation. Government officials must have access to appropriate skills, guidance and training as well as an organisational culture that supports both traditional and online tools.

7. **Co–ordination**: Initiatives to inform, consult and engage civil society should be co-ordinated within and across levels of government to ensure policy coherence, avoid duplication and reduce the risk of "consultation fatigue". Co-ordination efforts should not stifle initiative and innovation but should leverage the power of knowledge networks and communities of practice within and beyond government.

8. **Accountability**: Governments have an obligation to inform participants how they use inputs received through public consultation and participation. Measures to ensure that the policy-making process is open, transparent and amenable to external scrutiny can help increase accountability of, and trust in, government.

9. **Evaluation**: Governments need to evaluate their own performance. To do so effectively will require efforts to build the demand, capacity, culture and tools for evaluating public participation.

10. **Active citizenship**: Societies benefit from dynamic civil society, and governments can facilitate access to information, encourage participation, raise awareness, strengthen citizens' civic education and skills, and support capacity-building among civil society organisations. Governments need to explore new roles to effectively support autonomous problem-solving by citizens, civil society organisations and businesses.[2]

In the following sections of these guidelines we outline a series of ways in which these principles of public participation and community engagement might be operationalised in the context of contemporary water management and issues around water recycling.

[2] Organisation for Economic Cooperation and Development (OECD), *Focus on Citizens: Public Engagement for Better Policy and Services* (Paris: OECD, 2009), 79.

Common Starting Points

The findings of our research highlight the need to ensure that communication and engagement initiatives are responsive to how the public thinks about water recycling and to values that members of the public feel are relevant in considering potable reuse.

Until now, many of the science and risk communication initiatives about water recycling have been informed by the assumption that public concerns about drinking recycled water are caused by a lack of public understanding of water treatment technologies and by the influence of activist and oppositional campaigning organisations.[3] More broadly these approaches have tended to assume that the community is made up of 'passive individual receivers of authoritative messages transmitted by water companies and governments'. [4]

As we suggest above, our results highlight the limitations of this model and the need to change from a '**communication to'** to an **'engagement with'** model of community engagement and public participation. In order to develop new patterns of institutional communication and engagement through active partnership and collaboration with communities, the challenge is to jointly establish a set of '**common starting points**' that are shared by governments, regulatory agencies, citizens and institutions. These will normally take the form of core values, shared by all parties, that will guide decision-making.

Effective community engagement on water management will therefore require that institutions and citizens **collaboratively negotiate** a common framework for understanding water scarcity issues, the social values of water and the feasibility of a range of responses. The goal of community engagement practices in this area should be to partner with communities in **co-establishing** a set of **common values** that will guide decision-making processes.

As indicated by both the OECD and IAP2 principles, this approach requires a commitment on the part of institutions to engage citizens in ways that are meaningful and likely to influence decision-making processes. Furthermore, this approach requires that institutions engage in **active listening** by seeking to uncover commonly held public and community values concerning the management of water, and transparent processes whereby these values influence thinking and planning for the future management of water and possible new developments.

Open Issue Framing

Our research also indicates that it is critical that community engagement initiatives are designed in such a way that they '**open up**' decision-making to diverse inputs and perspectives, rather '**closing down'** policy processes to single issues and prescriptive outcomes.[5] Rather than focus on changing public attitudes toward predetermined policy outcomes the goal of

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[3] What we see here is a version of what has been characterised as the 'deficit model' – the assumption that public concerns about scientific or technological issues are caused by a deficit of public understanding of science. Much recent sociological research has demonstrated that the links between 'understanding' and 'acceptance' are complex. Further this research has demonstrated that increased public understanding of water treatment processes does not necessarily equate to broad acceptance of recycled water. See: Stenekes et al., "Risk and Governance in Water Recycling: Public Acceptance Revisited."

[4] Z Sofoulis et al., *Demand Management Through Cultural Innovation: Final Report* (Research Report to Water Futures Research Alliance/Sydney Water Project. Centre for Cultural Research, University of Western Sydney: 2007), 7.

[5] A Stirling, "Opening up or closing down? Analysis, participation and power in the social appraisal of technology," in *Science and Citizens: Globalization and the Challenge of Engagement*, ed. M Leach, I Scoones, and B Wynne (London: Zed Books, 2007), 228-29.

participatory community engagement processes should be to co-establish a platform of core values and the conditions that would be necessary for potable reuse to be technically feasible, economically sustainable and socially acceptable.

More broadly, our research suggests that while people responded positively to the concept of water recycling, and to the need to think about alternative water sources more generally, focus groups participants were not convinced of the need for potable reuse. What this suggests is that participatory forms of community engagement will be more effective in generating genuine public discussion and consideration of the dynamics of water management, environmental change and future water management issues.

In operationalising this principle of community engagement we suggest that it is necessary to refocus existing community engagement and community engagement practices around water recycling. In place of the current focus on single technology responses to the long term sustainability of water supplies, community engagement processes should first aim to identify common social and cultural values that will guide responses and policy-making – co-establishing a negotiated framework for understanding the issues – and then engage in collaborative planning processes that aim to develop these values in specific contexts and locations.

Brokering Community Engagement

As outlined in both the OECD and IAP2 principles of effective community engagement, a critical issue in the practice of public participation is the accountability of engagement processes. In addition to ensuring effective feedback mechanisms and that community engagement processes themselves are transparent, critical here is the perceived independence of institutions responsible for the carriage of community engagement practices.

While in some contexts in Australia it is foreseeable that formally independent bodies will be able to effectively foster community engagement processes, research conducted for the NDEEP project suggests that key public institutions, and particularly major water utilities, are not perceived as being independent participants in decision-making processes. In this context, the challenge is how these institutions might adopt different institutional roles and responsibilities in public discussion and in the consideration of water management and sustainability issues.

Our guidance here is that, in the absence of formally independent bodies, major water utilities should engage in community engagement practices that seek to expand the scope of possible responses and policy options. As we have suggested above, the focus of this approach to community engagement is to broker public consideration of the issues around water security and sustainability, without prefiguring the scope of possible policy outcomes. In this context the role of water utilities is to contribute to and clarify public discussion and policy-making while ensuring the independence and accountability of public participation initiatives. By identifying common and collectively held values, and investing in processes whereby these values shape and influence outcomes, water utilities and state agencies will be able to maintain a legitimate role in ongoing processes of community engagement and citizen consultation.

Institutional Uptake

As we have emphasised in these guidelines, it is critical that community engagement initiatives be coordinated alongside water planning processes to ensure effective institutional take-up of participatory processes. Critical here is ensuring effective collaboration and planning within water institutions, particularly between water planning, design and communication teams.

In order to ensure effective partnerships between engagement and planning processes it will be important to:

1. Align community engagement initiatives with the strategic priorities of institutions and develop a robust internal business case that outlines the ways in which public participation processes will add value to existing planning procedures. The benefits and goals that we articulate earlier in these guidelines may be adapted to the specific needs and requirements of institutions.

2. Develop more systematic coordination between community engagement, communications and media management within institutions. In media Guidelines that accompany this document we outline the ways in which media and community engagement strategies might be effectively coordinated so that communications and media messaging strategies support broader community engagement ambitions. [6]

3. Identify engagement 'champions' within organisations and provide effective training for technical staff will also enhance institutional coordination and take-up of community engagement initiatives.[7]

Governance and Planning

A critical dimension of the OECD principles of citizen participation is the notion of the coordination of initiatives that aim to 'inform', 'consult' and 'engage' publics. In practice it is likely that institutions will seek to engage citizens in multiple ways – across the IAP2 spectrum – seeking to inform citizens of current projects, consult communities about planned developments and directly engage citizens in direct forms of public participation.

In general we suggest that it is advisable for institutions to ensure that community engagement initiatives are coordinated as part of planning processes, with different strategies being adopted during the Pre-Approval/ Approval, Trial and Implementation phases of new initiatives.

This is important for two reasons. First, it is critical that community engagement initiatives are coordinated in ways that enable public participation and consultation to influence decision-making, and that institutions remain transparent about the constraints of the decision-making processes. Secondly, it is critical that community engagement processes be fully integrated into planning processes, to ensure that they do not become 'stand-alone' communication endeavours.

In addition, as planning processes develop and mature and possible outcomes are identified, community engagement processes will be tailored to the needs and context of each situation. In

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[6] J Motion and M Kearnes, *Water Recycling and Media: Guidelines for Communication* (Report of the National Demonstration, Education & Engagement Program, Australian Water Recycling Centre of Excellence & the University of New South Wales, ISBN: 978-1-922202-27-7.: 2014).

[7] A range of community engagement training programs are now available for water engineers and planners. For example, in NSW the Metropolitan Water Directorate coordinates the *Water Engineer Engagement and Education Training* Program.
(see: www.metrowater.nsw.gov.au/planning-sydney/water-educators/capacity-building). A range of both academic and consultancy organisations also offer training programmes in community engagement tailored to water engineers.

the case of the development of water recycling initiatives, we identify stages in the process of community consultation (see Figure 5):

Figure 5: Timing of community engagement initiatives

Pre-Approval/Approval
As outlined by the OECD and IAP2 guidelines, it is important that community engagement initiatives be undertaken as early as possible, both to enable effective public input and to allow for the development of a range of responses and possible outcomes.

The ideal stage to begin community engagement is in the Pre-Approval phase, where the goal is not simply to inform the public about water sustainability issues, but to start building relationships, and forming narratives and common values that will guide processes of consideration and discussion.

Trial
As projects move through the pre-approval and approval phases and enter the trial phase, community engagement practices will be tailored to key decision points that could apply to a water recycling solution, and seek input on these issues. There is still a significant opportunity to build positive and meaningful relationships with key stakeholders during this phase.

The key challenges here include responding to community concerns, ensuring the transparency of the planning processes and providing relevant and meaningful information about the implementation of collectively agreed outcomes.

Implementation
In the final implementation phase, engagement practices need to be focused on showing the public that decision-making is transparent and accountable, identifying avenues for ongoing engagement, and providing readily accessible and relevant information concerning the implementation of projects.

Section 4. Engagement Practices and Strategies

There are myriad tools and techniques available for community engagement. Some of the key questions to consider when selecting an engagement tool are:

- Who are we trying to reach?
- How diverse is this audience?
- How do they consume information?
- Do they have barriers (e.g. physical or language) to be considered?
- What are their reading and digital literacy levels?
- What outcomes and deliverables are being sought?

Reaching a broad and diverse community requires an accordingly diverse set of engagement tools. It also requires an integrated mix of online and offline activities, depending on the audience, issue and purpose. Figure 6 provides a snapshot of options for different phases.

Given the diversity of engagement and communication methods that have been developed in recent years there are also now a number of handbooks that outline the strengths and weakness of alternative methods and the suitability of particular approaches to 'participatory', 'consultative' and 'information sharing' community engagement. Figure 7 provides a breakdown of community engagement methods mapped against the IAP2 spectrum – 'Inform', 'Consult' and 'Participate'. These are useful guides for the practice and design of community engagement initiatives and we have also included references to a range of relevant guidebooks and case studies in Section 7.

In this section we provide a synoptic analysis of some key community engagement methods and approaches. We focus particularly on the Pre-Approval/Approval and Trial phases of community engagement.

A key element of the NDEEP project has also been the production of a range of communication tools. In this section we briefly introduce and discuss the ways in which these tools might be best utilised for effective community engagement practices.

Participatory Methods

Active Participation
Advisory committees
Citizens' juries / panels
Focus groups
Summits
Community visioning
Imagine workshops

Consultative Methods

Consultation
Discussion groups
Workshops
Interviews
Open days
Polls
Road shows
Surveys
Online forums

Communication Methods

Information Sharing
Advertising
Websites
Briefings
Fact sheets
Newsletters
Media outreach
Community meetings

Online Methods

Online Engagement
Online surveys
Social Media groups
Community panels
Online polls
Tweet chats
Videos
Slide shows

Figure 6: The diversity of community engagement methods

METHOD AND/OR TECHNIQUE	Information	Consultation	Participation
Action research	✓		✓
Advertising	✓	✓	
Advisory committees	✓	✓	✓
Briefings	✓	✓	
Charrettes	✓		✓
Citizens' juries	✓		✓
Citizens' panels	✓		✓
Collective learning techniques (World café)	✓	✓	✓
Community cultural development	✓	✓	✓
Community fairs/events	✓	✓	✓
Community meetings	✓	✓	
Community reference groups	✓	✓	✓
Community visioning	✓	✓	✓
Deliberative polling	✓		✓
Deliberative retreats	✓		✓
Design workshops	✓		✓
Discussion groups and workshops	✓	✓	
Displays	✓	✓	
Drama workshops	✓	✓	✓
Education and awareness programs	✓		
Fact sheets	✓		
Fishbowls	✓	✓	✓
Focus groups	✓	✓	✓
Future search conferences	✓		✓
Imagine	✓		✓

METHOD AND/OR TECHNIQUE	Information	Consultation	Participation
Informal club forums	✓	✓	
Learning circles	✓		✓
Media stories	✓		
Negotiation tables	✓		✓
Newsletters	✓		
News conferences	✓		
Newspaper inserts	✓		
Nominal group workshops	✓		✓
One-on-one interviews	✓	✓	
Open space technology	✓		✓
Online information processes	✓		
Open days	✓	✓	
Participatory editing	✓		✓
Partnerships for active participation	✓		✓
Photovoice	✓		✓
Planning for real	✓		✓
Policy action teams	✓		✓
Polls	✓	✓	
Precinct committees	✓		✓
Road shows	✓	✓	
Shop fronts	✓	✓	✓
Summits	✓		✓
Survey research	✓	✓	
Telephone hotlines	✓	✓	
Web-based consultation processes	✓	✓	✓

Figure 7: Information, Consultation and Participation Methods. (Source: *Engaging Queenslanders: A Guide to Community Engagement Methods and Techniques*)

Discerning Common Values

IAP2 Spectrum: *Involve/Collaborate/Empower*

Timing: *Pre-Approval/Approval*

NDEEP Tools: *Think and Drink Animations, Water Cycle Videos*

As outlined above, in the Pre-Approval and Approval phases of project planning the goal of community engagement initiatives is the generation of shared values through the involvement of diverse perspectives and through the participation of members of the general public who will be directly impacted by the proposed development. In this early and exploratory phase, community engagement methods such as citizen's juries, focus groups, stakeholder meetings and citizen's panels may be used to generate public discussion and to co-establish a shared framework for understanding between publics, stakeholders and institutions.

The development of the *Lower Hunter Water Plan* provides a useful case study of effective early stage public participation in water policy. Developed to ensure the future sustainability of water supplies in the Lower Hunter, even in drought conditions, the plan was the result of a collaborative, whole-of-government process, and utilised a representative community group method to identify community values in the coordination of the plan.

Led by the Metropolitan Water Directorate, the process involved 11 agencies as diverse as the Hunter Water Corporation, the Department of Health and the NSW Treasury. Importantly, planners also worked closely with the community and other stakeholders to develop the plan "so [that] their values, priorities and preferences could be incorporated into the decision-making".

Using a multi-stage approach, the initial rounds of the engagement process focused on shared community values and what water issues were most important to the participants. By feeding back the results of this process to subsequent workshop discussions, the project leaders were able to identify a set of shared community values and aspirations. These included:

- A process we can trust
- Sustainable solutions and water conservation
- A fair and affordable system
- Safe, healthy water for all uses
- Protecting the natural environment
- A secure, reliable supply for all
- A strategic, balanced and adaptable plan
- Investing dollars wisely
- Respecting the Aboriginal cultural value of 'life water'.[1]

Community members and representatives from a range of stakeholder groups were involved in four sets of workshops from December 2012 to September 2013.

What we see in this approach is that through a relatively open and inclusive approach community engagement practitioners were able to identify a broad-based set of commonly

[1] NSW Office of Water, *Engaging the community in developing the Lower Hunter Water Plan* (NSW Office of Water, The Department of Environment, Climate Change and Water., 2014).

shared values that operated as a platform for prioritising options as the project moved toward the planning and implementation phase.

Critical to the success of the community engagement project was the use of an iterative method that enabled group discussions to be developed and to mature over time, and a process that enabled community values to intersect with stakeholder and institutional expectations. It was through this long-term strategy that community engagement practitioners were able to identify and clarify shared values. Figure 8 shows the engagement process employed in developing the plan, which entailed successive phases of deliberative discussion, feedback, and refinement of themes and options.

Building on this participatory approach, in the second round of consultation participants were given access to information on demand forecasts and, on the basis of a shared set of co-established values, were able to begin considering possible options and ranking possible responses. The use of a multi-criteria decision analysis method – that combined insights from the community workshops and forecasts of future needs – enabled the development of a range of possible options which formed the basis for the final round of citizen engagement and discussion workshops and influenced to the shape of the final water plan.

NDEEP Tools:
In this phase of engagement practice the most relevant of the NDEEP communication tools would be the 'Think and Drink' animations and the 'Water Cycle' videos.

The 'Think and Drink' animations are a series of small video clips, designed to spur conversation and critical thinking about water.

Similarly the 'Water Cycle' videos produced through the NDEEP project are designed to inform and stimulate conversations about water.

Used in the context of deliberative processes designed to uncover shared community values around water, these tools will provide a vivid stimulus for collective discussion. These tools are also adaptable for use in equivalent online engagement practices.

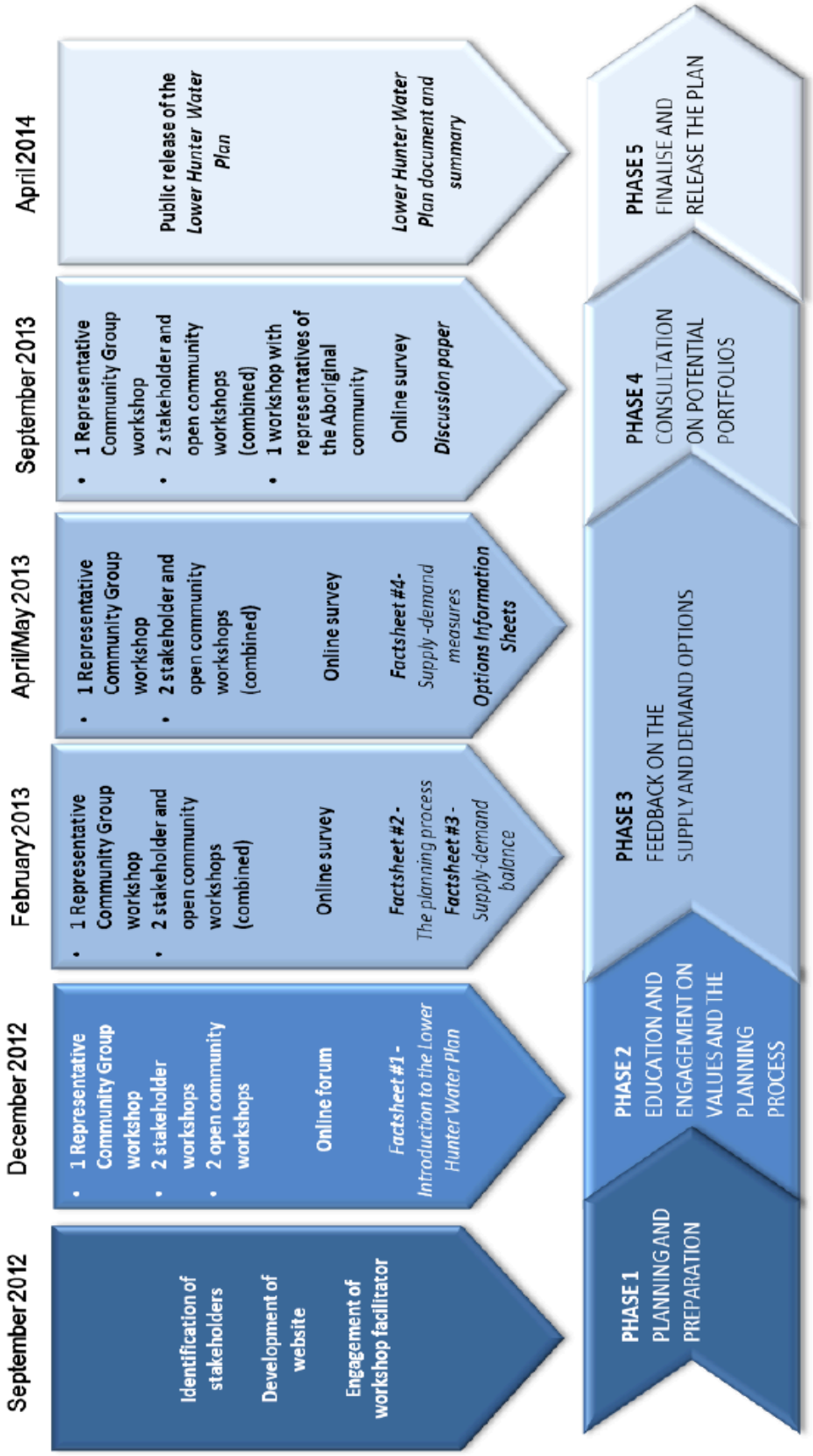

Figure 8: Lower Hunter Water Plan Community Engagement Process

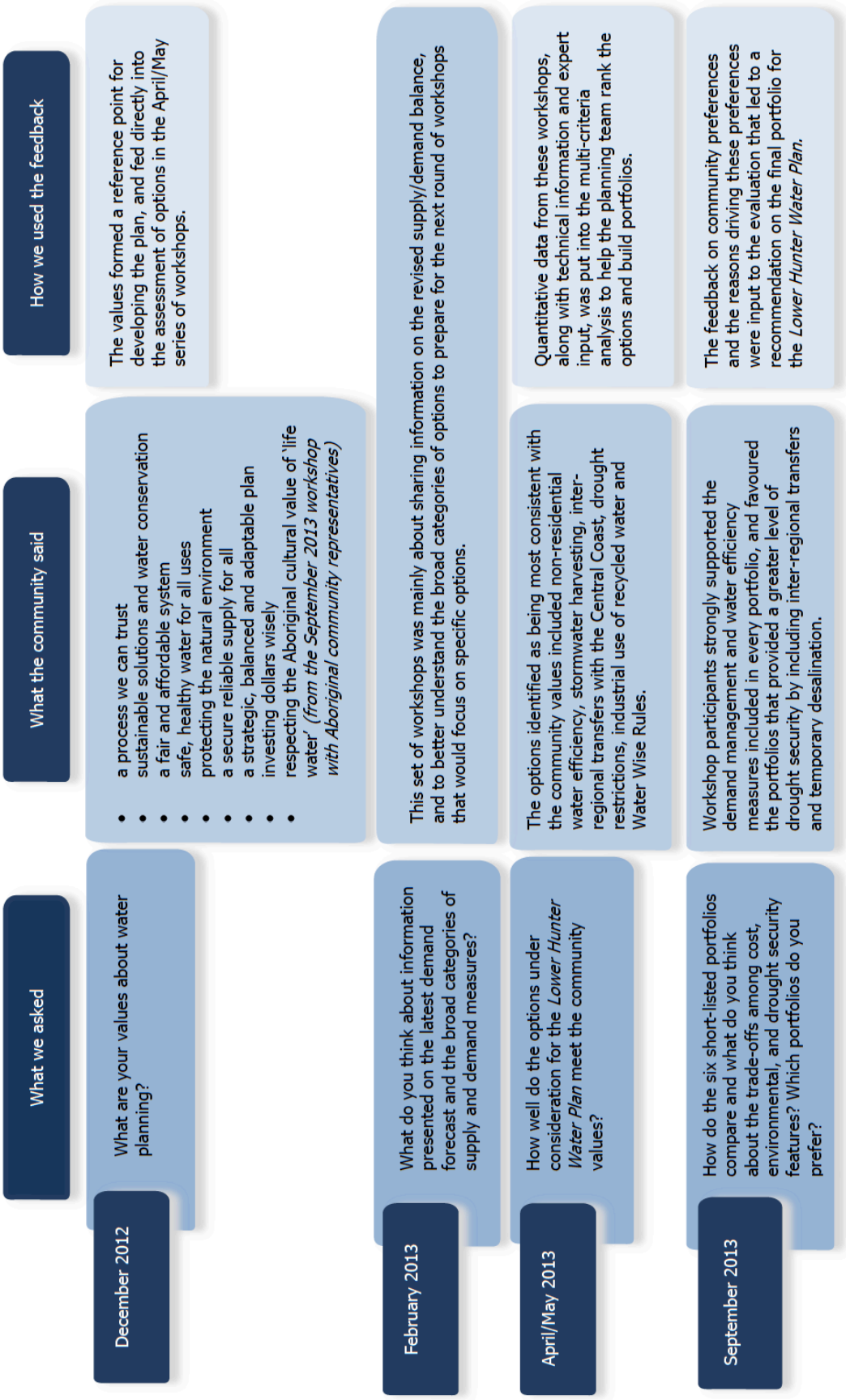

Figure 9: Consultation Process, Lower Hunter Water Plan

Deliberating Outcomes

IAP2 Spectrum: *Involve/Consult*

Timing: *Trial*

NDEEP Tools: *Water Cycle Videos, Global Connections Map*

As outlined above, in the trial phases of project planning the goal of community engagement initiatives is the deliberation and negotiation of policy options and outcomes, framed by shared values established in earlier phases of the community engagement process. In this transitional phase methods such as citizen's juries, workshops, deliberative polling and multi-criteria assessment may be used to prioritise options and frame possible outcomes.

In this phase, community engagement processes should be designed to capitalise on the relationships between publics, stakeholders and institutions established in earlier phases, by maintaining ensuring that the goals of the process are collectively defined, and clearly articulated and by ensuring participants that the process will influence outcomes.

The WA Water Corporation Groundwater Replenishment Trial (GWRT) is a useful model for the design of community consultation and engagement strategies in the trial phases of water recycling initiatives.[2] Coordinated as a component of a ten year community and stakeholder engagement process – entitled *Water Forever, Whatever the Weather* – the GWRT was designed to ensure the climate resilience of water supplies in Western Australia. The need for a trial groundwater replenishment initiative was identified in 2004.

During the development of the GWRT Water Corporation utilised a range of engagement and consultation practices designed to "maintain relationships with stakeholders and the community that facilitate open and ongoing exchange of knowledge and information" and address "the concerns, issues and questions of stakeholders and the general community".[3] Based on survey research undertaken during the GWRT, Water Corporation identified four key community concerns and develop coordinated communications and engagement strategies to provide regular information updates and avenues for direct consultation.

These issues included:

1. Trust in Water Corporation to deliver and operate the GWRT;
2. Key government announcements regarding the GWRT;
3. The environmental approval process for the GWRT; and
4. The possible construction impacts of the GWRT.

Across each of these areas Water Corporation developed targeted communication and engagement strategies – including the use of newsletters, visitor centre tours, and community open days and events alongside the use of social media and media briefings.

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[2] See: Water Corporation, *Groundwater Replenishment Scheme: Communications Strategy 2013–2016* (Perth: Water Coporation, 2013), Water Corporation, *Water Forever South West - Community Engagement Report* (Perth: Water Corporation, 2014).

[3] Water Corporation, *Groundwater Replenishment Scheme: Communications Strategy 2013–2016*, 6.

Critical to the success of the GWRT was a long-term vision for water sustainability in Western Australia and a clarity in institutional messages and communication strategies.[4] As the GWRT moved through the initial conception and into the trial phase, Water Corporation worked closely with community groups and stakeholders to identify key community concern and provided targeted information to respond to these issues.

NDEEP Tools
In this phase of engagement practice the most relevant of the NDEEP communication tools will be the 'Water Cycle' videos and the 'Global Connections' map.

The 'Global Connections' map provides a series of resources on the use of recycled water around the world in an interactive and dynamic format.

Used in conjunction with the 'Water Cycle' videos, and set in the context of a multi-criteria process that aims to generate a range of possible options, these tools will inform discussion of the likely conditions necessary for the implementation of potable reuse schemes.

Keeping People Informed

IAP2 Spectrum: *Inform*

Timing: *Implementation*

NDEEP Tools: *FAQ Videos*

As projects near implementation phases it remains important to ensure that members of the public are well informed about the nature, scope and siting of water recycling initiatives. In addition to regular public notices via newsletters and online media, a range of methods are relevant in this phase. Direct public involvement remains an important strategy, and meetings designed to foster community discussion and interaction between policy makers and the public are important to ensure that the community remain well informed about new developments. The use of social media, factsheets and online communications is also advisable as a response to common concerns and questions about the nature of the envisaged project.

NDEEP Tools
The most relevant NDEEP tools at this phase of the project include FAQ videos, which provide short presentations of potable reuse, focused on questions of 'Need', 'Benefit', 'Reliability', 'Resilience', 'Sustainability' and other environmental and regulatory considerations. Again, used in combination with a range of engagement methods. These tools will enable community discussion and consideration of water recycling issues, and may be used in both offline and online settings.

In this phase of the engagement process, providing feedback is just as important as seeking input in the first place. The NSW Government document, *Community Engagement in the NSW Planning System*, explains, "Providing feedback to participants … reassures them their views and concerns are being heard and considered. The level of trust and cooperation between the organisation and community is likely to increase through appropriate feedback."

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[4] Please also see: R Carr, *Governance, Decision Processes and Pricing; Implications for Purified Water Projects. Case Study #2 (of 3) – Western Australia (Perth) Groundwater Replenishment Trial* (Research undertaken for the Australian Water Recycling Centre of Excellence by Marsden Jacob Associates Financial & Economic Consultants: 2013).

The guide goes on to state that "timely and informative feedback should be given at each stage of the process".

Options for providing feedback include:

- Write letters to all participants
- Provide summary reports of meetings/workshops
- Acknowledge written submissions
- Provide telephone hotlines
- Offer discussion/issues papers
- Provide updates on website/social media

This process needs to happen in an ongoing process of providing information, seeking input and sharing feedback, as outlined in Figure 10 below.

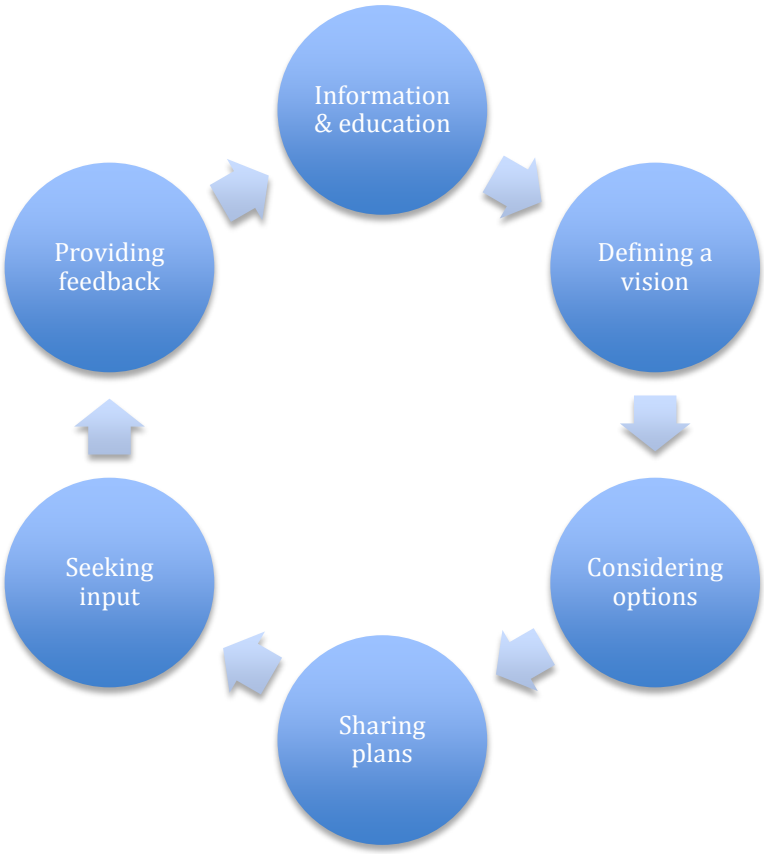


Figure 10: Community engagement process

Section 5. Evaluation and Institutional Learning

It is vital that evaluation begins in the planning stages of a community engagement program and continues throughout the activity.

Evaluating community engagement should assist on a number of levels:

- Discover what worked well and what did not;
- Identify unanticipated outcomes;
- Apply learning to improve future practice in engagement activities;
- Assess whether the exercise was cost effective in terms of time and resources; and
- Identify whether the involvement of communities met the community engagement objectives and contributed to improved decision-making.

How best to frame these insights, however, is probably the biggest challenge for any organisation as there is no one-size-fits-all process for evaluating community engagement. An evaluation framework must be developed for each engagement activity, tailored to the purpose for which the evaluation will be used, the intended audience, the type of engagement and the scale and significance of the activity (see Figures 11 and 12).

PRINCIPLE	INDICATOR
Integrity	• Openness and honesty about scope and purpose • Appreciate respective roles and responsibilities
Inclusion	• Opportunity for a diverse range of values and perspectives to be expressed • Representative of the population • Appropriate and equitable opportunity for all
Deliberation	• Sufficient and credible information for dialogue • Space to weigh up options, understand and reframe issues
Influence	• People have input in how they participate • Policies and services reflect their involvement
Capacity	• Address barriers • Build capacity and confidence of people to participate meaningfully • Develop confidence in the process and value of their participation • Engender a sense of shared ownership
Sustainable Decisions	• Transparency • Subject to evaluation • Recognise and communicate the needs and values of all parties • More cohesive and informed communities and governance result from the process

Figure 11: Principles for assessing engagement success

Rating Scale	
Score 1, 2…	9, 10
Integrity Scope, timing and process of decisions not clearly communicated; participants are not clear how they can influence; roles and responsibilities poorly defined.	Participants have a clear sense of the scope of the process and their role in it at all times – they have a tight degree of trust and good relationship with the proponent.
Inclusion Participants do not strongly reflect relevant characteristics of the relevant population; no opportunity to consider/discuss other values and viewpoints; limited opportunities for participation.	Participants strongly reflect relevant characteristics of the community; a variety of opinions, values and needs are heard and discussed.
Deliberation No opportunity for informed debate and reflection; inadequate information provided to participants to participate meaningfully.	Opportunity for informed deliberation; increased understanding and movement towards identifying common ground.
Influence Little promise of enactment of recommendations; scope of influence is not defined or understood by participants; decision-making not transparent.	Strong contact to enact recommendations; the community plays an active role in deciding how they will participate; a clear demonstration of how participants have influenced the outcomes.
Capacity Participants do not understand key elements of the discussion; they feel unable to participate meaningfully in discussions.	Participants are given adequate information and resources to participate meaningfully they have a high degree of confidence in the process and believe their contribution will have impact.
Sustainable Decisions Decisions and the role participants play are not clearly communicated, no evaluation of processes or outcomes, decision makers are not confident of acting on participants' recommendations.	Participants can clearly see the impact of their contribution, decisions are understood, participants are involved in the evaluation process.

Figure 12: The rating scale for the assessing engagement success

In view of the specific conditions of engaging communities, the insights will be different for each program. However, there will be commonalities from an institutional learning perspective, such as:

- Planning for community engagement;
- Inclusive community engagement; and
- Facilitation for community engagement.

The sharing of information will take the form of formal, or informal channels – see Figure 13. From an informal perspective, information is shared across the organisation, but the relationship with the audience is a passive one – essentially, they are not requested to contribute. The formal learning – on the other hand – will ensure greater engagement with the wider organisation; such formats include bespoke training and online courses.

Information Sharing	Formal Learning
Master class workshops	E-learning e.g. 'The Community Engagement how to' module
Campaign video footage	Bespoke training e.g. facilitation, planning
Community meetings transcribed notes (Archived)	Development and amendments to corporate engagement guidelines
Specialist content for regular internal communications channels	Development and amendments to framework tools

Figure 13: Information Sharing Channels

Appendices

Appendix 1: Further Reading

There are a number of useful resources on the design and delivery of effective community engagement initiatives. Some relevant examples include:

Guidelines

Department of Sustainability and Environment. 2005: *Effective Engagement: Building Relationships With Community and Other Stakeholders - Book 1, An Introduction to Engagement*: State of Victoria, Department of Sustainability and Environment.

Planning NSW. 2003: *Community Engagement In The NSW Planning System.* Sydney: NSW Department of Local Government.

Queensland Government Department of Communities. 2007: *Engaging Queenslanders: A Guide to Community Engagement Methods and Techniques.* Brisbane: Queensland Government Department of Communities.

Reviews of Community Engagement Practice

European Institute for Public Participation. 2009: *Public Participation in Europe: An International Perspective*: European Institute for Public Participation.

Holmes, B. 2011: *Citizens' Engagement in Policymaking and the Design of Public Services*: Research paper, No.1, 2011-2012, Parliamentary Library, Parliament of Australia, Department of Parliamentary Services.

Organisation for Economic Cooperation and Development (OECD). 2009: *Focus on Citizens: Public Engagement for Better Policy and Services.* Paris: OECD.

Appendix 2: Case Studies

Some relevant examples of community engagement processes include the Groundwater Replenishment Trial conducted by WA WaterCorp and the Lower Hunter Engagement process conducted by the NSW Metro Water Directorate.

Water Forever

South West

Community Engagement Report

WATER CORPORATION

Foreword

The Water Corporation has reached a prominent milestone in its planning for safe, secure and sustainable water supplies in the South West region for the next 50 years.

With input from communities throughout the region over the past six months, we are pleased to present our Community Engagement Report.

This report details the comments, ideas and suggestions that have been provided by stakeholders and the community about their expectations to secure future water supply for the region.

I am delighted at the volume, range and quality of responses that you, our community members and stakeholders, have provided. They will help to prepare a *Water Forever: South West* plan and ensure it is guided by local knowledge and needs.

I warmly thank all those who have been involved so far, and look forward to a continuing high level of interest as we move towards producing a final *Water Forever: South West* report in a few months' time.

Catherine Ferrari
General Manager, Customer and Community Group

Table of Contents

Acknowledgements

We acknowledge the valuable contribution made by the South West community and stakeholders.

Particular thanks go to the Department of Water, Busselton Water, Aqwest and local government authorities for their ongoing contributions and engagement with the project.

We also thank the catchment councils, businesses, farmers' markets, and community resource and visitor centres for providing venues and support for our community information displays and workshops.

The community attitudes survey for this project was conducted independently by research company, Ipsos. Both surveys conducted as part of this project were analysed and reported by Ipsos.

Ipsos
Ground Floor, 338 Barker Road, Subiaco WA 6008
Tel: (08) 9463 0739, www.ipsos.com

The community workshops held in Busselton and Nannup were facilitated by Joel Levin from Aha! Consulting.

Aha! Consulting
Unit 1/265 Walcott St, North Perth WA 6060
Tel: (08) 9443 9474, www.ahaconsulting.net.au

Introduction

We live in an increasingly dry climate, and the Water Corporation is working to ensure that there is enough drinking water across the South West of Western Australia.

We plan to do this by becoming climate resilient.

This requires a balance of reducing water use, increasing the amount of water we recycle, and developing additional water sources.

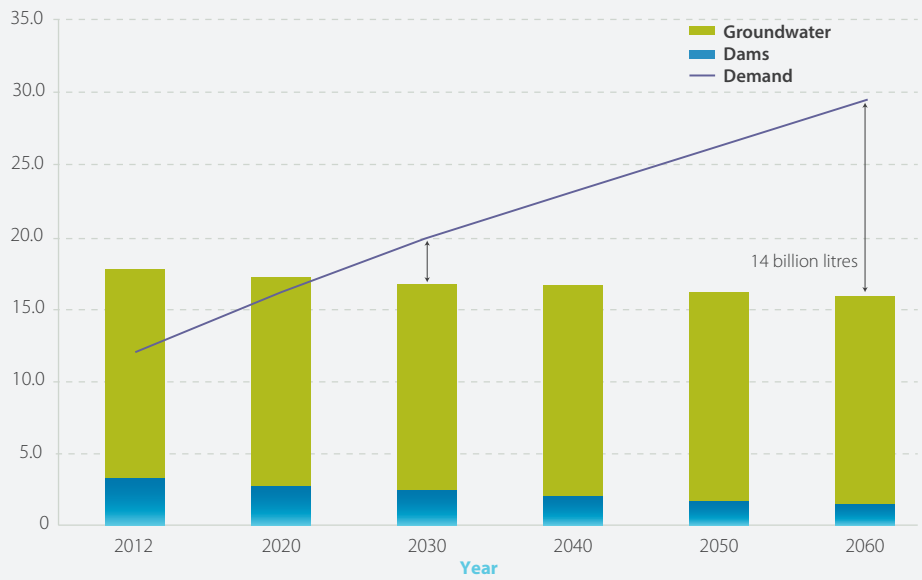
Water Forever: South West is a planning study to ensure we can continue to provide a sustainable and secure water supply for the towns we service in the South West. We need a long-term plan to support regional town development, particularly in rapidly growing coastal areas.

The plan will identify water source options to safeguard water supplies over the next 50 years — no matter what the future brings. While winter rainfall has traditionally been our primary water source for the South West, in recent years we have seen record-low rainfall and inflows to dams. We will still use our dams but we need to think about a combination of solutions that are less reliant on rainfall.

Since the project was officially launched by the former Water Minister, Terry Redman, on 16 August 2013 in Margaret River, a key part of the project has been to consult with the community and stakeholders about how to meet this challenge.

Former Water Minister, Terry Redman, at the project launch.

Figure 1: Projected water supply and demand, 2012–2060



Excludes areas supplied by Aqwest and Busselton Water.

Engagement approach and objectives

By engaging with the community on *Water Forever: South West*, we set out to:

- provide information about our current activities and potential options for the future.
- obtain feedback on these potential options.
- provide opportunities for a wide range of community members, including stakeholders, technical experts and industry, to contribute to the South West's water future.
- generate new ideas for water service delivery.

The community engagement process allowed community members to provide their feedback through a range of channels from August 2013 to February 2014.

It kicked off with a mail-out to our customers in the South West informing them about the project and inviting registrations to receive updates.

We then undertook a series of stakeholder briefings and held community information displays, workshops and forums across the region. We provide summaries, general themes and comments from these activities in this report.

There were two surveys conducted as part of the project. The first was open to the public on our website and through face-to-face interactions with the community. The second survey was a statistically representative phone survey of randomly selected Water Corporation customers in the South West.

In addition to planned activities, we listened to stakeholder feedback and adapted our engagement activities to include other ways for the community to be involved. We accepted invitations to present at public forums in Busselton, Margaret River and Nannup, and added Augusta, Bridgetown and Donnybrook to our community information display venues.

Throughout all these activities, there were divergent views on many issues, however some common themes emerged.

Figure 2: Water Forever South West project area

Key themes

South West Yarragadee

During the engagement process, members of the South West community expressed their concern that groundwater from the South West Yarragadee Aquifer would be used to supply the Perth metropolitan area.

We have no plans to pump water from the South West Yarragadee to Perth and it is not a potential option being considered as part of the *Water Forever: South West* project.

This is consistent with the State Government's position that groundwater in the South West is used to supply towns in that region, and the Department of Water's South West Groundwater Areas Allocation Plan (2009) that reserves groundwater in the South West region for future town water supply.

Perth's water supplies have been secured through increased water efficiency practices and water recycling, and the development of groundwater replenishment and seawater desalination. The completion of stage 2 of the Southern Seawater Desalination Plant has increased its capacity to 100 billion litres per year; and we are on schedule to begin construction of stage one of a full-scale groundwater replenishment scheme in July 2014.

Environment and climate change

The South West is an internationally recognised biodiversity 'hot spot' with unique ecosystems. Environmental concerns and the impact of climate change on ecosystems were raised by many stakeholders.

There is a strong appreciation of the natural beauty in the region and concern over the broad impacts of increased development.

Much of the interest in water efficiency measures was driven by a desire to reduce environmental impacts.

Regulation of water resources

The control, access and management of groundwater and surface water resources were other common themes. There were many questions about the role of the Water Corporation as opposed to the Department of Water.

The Department of Water is the state's water resource manager, which is responsible for:

- developing allocation plans
- setting allocation limits
- licensing, monitoring and enforcing abstraction limits in line with their allocation plan
- monitoring regional environmental responses, and
- preparing water quality improvement plans, including for salinity and drainage.

Water Corporation customers use only seven per cent of licensed groundwater in the South West region (and six per cent of surface water). The rest goes to commercial users (such as irrigators, industry, mining and agriculture), domestic users (self-supply properties) and other water utilities. It is the Department of Water's responsibility to manage these allocations and licences.

Recognising the importance of town water supplies as an essential service, a proportion of the groundwater available for licence is reserved for future allocation to water utilities.

Water conservation and efficiency

Throughout the region, there was strong support and interest in water efficiency measures including rainwater ranks and recycling. It was recognised that we all need to use water more efficiently, and community members and stakeholders want to see behaviour change through education, incentives (including water pricing) and regulation (for example, building codes).

There was an overarching sentiment that everyone needed to do their part, not only residential users. In particular, community members highlighted the need for larger users such as mining, industry, agriculture and local governments to do their part to use water wisely.

Engagement activities

Community registration

When	From 16 August 2013
Where	*Water Forever: South West* project area
Who	South West community
How	We sent a brochure and letter to 21,138 of our customers to provide an outline of the project and how the community could be involved.
Goal	To invite community members and stakeholders to register for updates about the project.
Outcome	251 registrations

Stakeholder briefings

When	August 2013 to March 2014
Where	South West region and Perth
Who	Stakeholder groups for the South West region, including State Government departments, water utilities, local government authorities, media, and Aboriginal, community and environmental groups.
How	We contacted 43 stakeholders by letter and phone to offer briefings on the project.
Goal	To present information about the project and discuss potential future water supply options for the region.
Outcome	We provided 62 stakeholder briefings (refer to Appendix I for a full list).

Throughout the stakeholder briefings, the most prominent theme that emerged was the need for the community to maximise its usage of existing water sources. This includes 'stepping up' water efficiency efforts and increasing the amount of water recycling.

The future of groundwater resources was also high on the agenda. With a drying climate, stakeholders expressed concerns about the amount of groundwater that would be available in the future and the impact groundwater abstraction might have on the environment. The Blackwood River and Lake Jasper were two specific areas of concern.

In line with the views of the broader community, the feedback from stakeholders showed high support for water efficiency measures, particularly increases in:

- community education and a focus on builders, landscapers and new developments
- water efficiency monitoring and tougher penalties for those watering outside rostered days, and
- the use of rainwater tanks.

For the region's future water supply, a range of options were supported and proposed including continued investment in dams for higher rainfall areas. Other stakeholders supported more climate independent sources such as desalination, although they recognised there are cost and energy usage implications with this option. Groundwater replenishment and water recycling were supported by some stakeholders, while there were mixed views on integrated schemes to provide water security between towns.

Because there is a growing concern about saltwater intrusion into groundwater some stakeholders are in favour of using recycled water to provide a saltwater barrier. There were also advocates for stormwater harvesting to increase water recycling.

Water pricing was mentioned by some stakeholders, with suggestions to adopt pricing which reflects the scarcity of water resources and provides an incentive for more water efficient behaviour.

Some stakeholder groups do not support continued water carting in Northcliffe and Quinninup.

The strongest theme emerging from our discussions with stakeholders was for more water recycling. Stakeholders would like to see more water recycling for public open space, but noted that cost is currently a major barrier.

They also want more recycled water used for industry (for example, dust suppression) and in new urban developments (for example, third/purple pipe and greywater systems), commenting that greater government support is needed for the planning stages of these developments.

"Recycled water for drinking has been used successfully overseas for years — Australia needs to catch up." **(Stakeholder feedback)**

"We need to think about water holistically – clearing native vegetation decreases rainfall." **(Stakeholder feedback)**

Community information displays

When	4 September to 1 November 2013
Where	Collie | Eaton | Dalyellup | Donnybrook | Dunsborough Margaret River | Augusta | Pemberton | Manjimup | Bridgetown | Nannup | Greenbushes
Who	South West community
How	We staffed information displays at various locations and times to discuss the project with the community and collect feedback either through survey forms or general comments.
Goal	To create family-friendly displays at high traffic locations (e.g. shopping centres and farmers' markets) to talk with community members one-on-one about their future water supplies. To reach a wide cross-section of the community, particularly those who would not normally attend a formal community engagement event.
Outcome	21 community displays

At the community displays, our focus was primarily on introducing the project and providing information about potential water supply options to help community members give their feedback and/or complete a survey form.

There was a lot of interest in the fact sheets developed for water supply schemes. There also were questions about water supply options and general support for a 50-year plan.

The main feedback at these displays was for more water recycling and water efficiency measures, particularly the use of domestic greywater systems and rainwater tanks. There was also a general concern about the use and quality of groundwater sources.

At some locations, there was support for the ongoing use of dams.

Survey form

When	August to November 2013
Where	South West region and publicly available online
Who	General community aged 18 years and over
How	The questionnaire was developed in-house and made available on our website and at community displays and forums. An independent research company, Ipsos, collated and reported on the data.
Goal	To gauge community perception towards various water supply, recycling and efficiency measures.
Outcome	106 survey responses submitted

There was sound representation of respondents from across the South West region, although Busselton, Manjimup and Augusta-Margaret River made up for more than one-third of respondents.

The survey responses were used to identify general themes and to help develop the community attitudes survey. Overall, the results correlate with the community attitudes survey in terms of support for the various water supply, efficiency and recycling options (see page 13).

They indicate that:

- the most popular sources to address future water needs are catchment management activities, along with new pipelines to inter-connect town water supply schemes, and dams to provide additional water security.
- the level of support for water recycling and water efficiency measures is high, with strong support for water recycling for industry, agricultural use and public open spaces.
- rainwater tanks, domestic greywater systems, retrofitting plumbing fixtures and smart metering have high levels of support as water efficiency measures.
- leak detection and greywater systems are two water efficiency practices that a high proportion of respondents would consider using.
- education and financial incentives are effective ways to encourage customers to be more water efficient.

"The future needs in the South West will, like most places across the globe, escalate. We must start now to plan for the future."

(Survey respondent)

"More financial incentives and training, and making industry more accountable especially in building new houses."

(Survey respondent)

"I feel that the Water Corporation has started to educate the population – this does take time, so keep at it."

(Survey respondent)

Busselton forum

When	19 September 2013
Where	Busselton Community Resource Centre
Who	Friends of the Yarragadee members and invited guests Representatives from the Department of Water and Busselton Water attended to answer questions
How	Presentations by local geologist and *Water Forever: South West* project team, followed by a 'question and answer' session.
Goal	To give an overview of the project and answer specific questions from the group.
Outcome	About 45 community members attended

In response to a request from the Friends of the Yarragadee, we gave a presentation to the group, followed by a 'question and answer' session.

At the forum, several participants commented that there was too much information being presented and more time was needed for the community to discuss the options. In response, we presented at another public forum in Margaret River (see page 10) and held two facilitated community workshops in Busselton and Nannup (see page 12).

The feedback about water security and supply options included: more rainwater tanks and planting trees; concerns about sprinkler usage by market growers; and concerns about the effect of groundwater replenishment on the aquifer.

There were also comments about poor water quality and saltwater intrusion into groundwater supplies in Busselton and Bunbury caused by over-abstraction, which were responded to by the Busselton Water CEO at the forum.

Members of the Friends of the Yarragadee expressed their fear that water would be taken from the South West Yarragadee Aquifer and pumped to Perth for use in the metropolitan Integrated Water Supply System.

As explained under 'Key Themes', the group was assured that we do not plan to pump water from the South West Yarragadee to Perth and it is not a potential option being considered as part of this project.

"Rainwater tanks to be seriously considered in the plan".

(Busselton forum participant)

"All these unlicensed and unregulated bores must be having a huge effect on the aquifers."

(Busselton forum participant)

Margaret River public forum

When	17 October 2013
Where:	Margaret River Permaculture Centre
Who:	General public invited Representatives from Department of Water attended to answer questions on surface and groundwater allocations
How	Presentations by local geologist and *Water Forever: South West* project team, followed by a 'question and answer' session. Feedback from participants was collected on post-it notes.
Goal	To explain water supply options in further detail and answer questions from the community.
Outcome	About 30 community members attended

The Margaret River Regional Environment Centre and Friends of the Yarragadee invited us to give a presentation on the project at a public information forum.

At the forum, there was a strong focus on water use efficiency and water recycling, with the community providing many creative ideas. Rainwater tanks and retrofitting plumbing fixtures were mentioned several times in participant feedback. There were also comments about water pricing to encourage water efficiency, and concerns about whether industry and mining were being held accountable for their high water usage.

Greywater systems and capturing stormwater were suggested as ways to increase water recycling, along with education to promote awareness of water usage and efficiency measures. There were some environmental concerns, particularly in relation to gas bores near aquifers.

"Capturing stormwater before it flows to sea."

(Margaret River forum participant)

"Need to plan for recycling to potable quality sooner rather than later."

(Margaret River forum participant)

"Better infrastructure to allow for water to be used more wisely. It already exists – just need to see more of it."

(Margaret River forum participant)

"Language is important in shaping belief. Avoid 'water costs nothing' – there is huge cost to future generations."

(Margaret River forum participant)

Australian Water Association conference presentation

When	25 October 2013
Where	Busselton
Who	Technical experts and professionals involved with water
How	The project team was invited by the WA branch of the Australian Water Association to present at their National Water Week Conference.
Goal	To raise awareness of the *Water Forever: South West* project and invite feedback from water industry experts.
Outcome	58 participants

Each year, the WA branch of the Australian Water Association holds a conference during National Water Week. It is one of their calendar highlights, bringing together a range of water industry professionals to discuss a variety of topics. In 2013, the conference was held in Busselton and was based on the National Water Week theme of 'Liveable Communities' with a South West regional focus.

Our stakeholder engagement manager for the *Water Forever: South West* project gave a presentation to raise awareness of, and encourage feedback and discussion about, the project.

Fifty-eight people attended the conference which was promoted through the Australian Water Association and supported by local water utility Busselton Water.

Other conference presentations included: Managing groundwater in a drying South West; Managing large dams and downstream flows in the drying climate; and Water quality improvement projects in the South West.

Community workshops

When	23 and 30 November 2013
Where	Busselton and Nannup
Who	General community
How	In consultation with a community planning committee, two workshops were held to allow more time for community members to discuss the project and potential source options. The workshops were publicised through local media, online and the project stakeholder database. They were facilitated by an independent consultant.
Goal	To provide an opportunity for community members to absorb information about the project and discuss in more detail potential source options.
Outcome	12 participants (across both workshops)

The workshops held in Busselton and Nannup were not well attended, therefore the feedback represents individual comments rather than general themes.

At the Busselton workshop, topics of discussion included water pricing, desalination, queries about catchment management (i.e. clarification about what it is), groundwater replenishment costs, the feasibility of third pipe systems and how leak detection works.

In terms of water sources, there was general support for local groundwater and water trading between existing users. Desalination was recognised as an option if powered by renewable energy.

At the Nannup workshop there was a broad spectrum of views, some of which differed substantially. For example, while some participants were against further development of towns, others were in favour of it. Similarly, some community members thought that households should be the focus of water efficiency campaigns, whereas others wanted more emphasis to go on industry and agriculture.

There were discussions on groundwater usage, behavioural programs, water usage for gardens, agriculture usage and the commercial sector.

"Change how we look at gardens, beyond being waterwise; traditional gardens are no longer viable."

(Nannup workshop participant)

As with Busselton, there also were queries and discussion about catchment management, third pipe systems and groundwater replenishment.

There were also suggestions to restrict the size of lawns and limit new residential developments, however these are broader policy matters beyond the scope of the Water Corporation.

Generally, participants supported educational programs, leak detection, desalination, rainwater tanks, dams, and recycling treated wastewater for industry, agriculture and public open space.

"Number one priority is to get people to use less water."

(Nannup workshop participant)

"Desal is okay if it is run on renewable power or has the appropriate offsets in place."

(Nannup workshop participant)

"We need to better value water. A more realistic price will make people think."

(Busselton workshop participant)

Community attitudes survey

When	Conducted 20–29 January 2014
Where	*Water Forever: South West* project area
Who	Randomly selected Water Corporation customers
How	An independent research company, Ipsos, developed the survey questions in consultation with us, then conducted the survey by phone, and analysed and reported the results.
Goal	To formally survey our customers about their opinions and support for various water supply, recycling and efficiency measures, and to ensure there was statistically reliable data from the community.
Outcome	400 interviews conducted

Because of the number of people interviewed across the region, the community attitudes survey provides the most statistically valid data and forms the basis of the feedback reported below under 'What you said'.

The community and stakeholder views from other engagement activities complement the results where relevant, and feedback from all engagement activities will be taken into account for the draft plan.

"We live in an area which is well known for its large groundwater reservoir so it should be utilised."

(Phone survey participant)

Submissions

When	August to December 2013
Where	South West region
Who	Open to stakeholders and general public
How	At stakeholder briefings, and through general communications and advertising, stakeholders and community members were invited to submit formal submissions and written feedback.
Goal	To obtain formal submissions and written feedback from stakeholders and community members.
Outcome	Five submissions were received from: Shire of Manjimup, Shire of Nannup, Bunbury Wellington Economic Alliance, resident of Dunsborough and resident of Bridgetown.

The submissions are summarised at Appendix II and only include the comments which relate to the scope of the *Water Forever: South West* project. We will respond to all formal submissions directly and will provide responses to the comments that fall outside the scope of this project.

Informal feedback

When	August 2013 to January 2014
Where	South West region
Who	General community
How	The project team encouraged informal feedback throughout the project. This was collected through emails, letters, telephone calls, and at community displays and workshops.
Goal	To provide a range of ways for the community to provide their feedback.
Outcome	Nine community members provided informal feedback.

The few emails, letters and phone calls we received relate to rainwater tanks, groundwater levels, water carting to Northcliffe, water recycling using aerobic treatment units, limiting lawn sizes and the effect that sourcing water has on ecosystems.

The feedback relating to specific areas or subject matters has been taken into account for the draft plan.

What you said

Overview

The data reported in this section is from the community attitudes survey (see page 13).

In general and across all engagement activities, the South West community acknowledges that we live in a drying climate and that addressing our water needs and reducing water consumption are important issues.

Water recycling was also strongly supported through all feedback channels.

However, the acknowledgement of a drying climate seems to be in more general terms rather than specifically relating to the South West, with many community members advocating for more dams and catchment management as future water supply preferences — both of which are highly reliant on the climate.

"I think that the South West rain is consistent through winter, so catch more of that."

(Phone survey participant)

"We need a reliable supply and the Water Corporation should take the lead to plan for climate change."

(Survey form respondent)

Figure 3: Agreement that Western Australia is in a drying climate

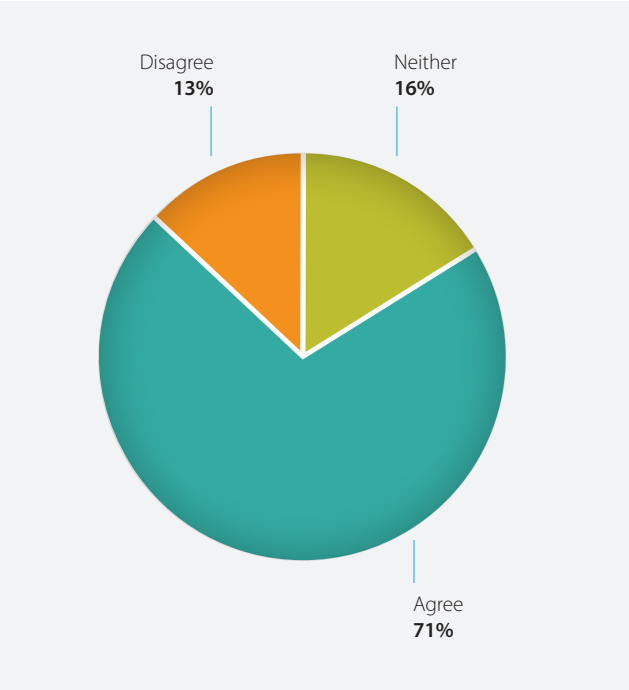
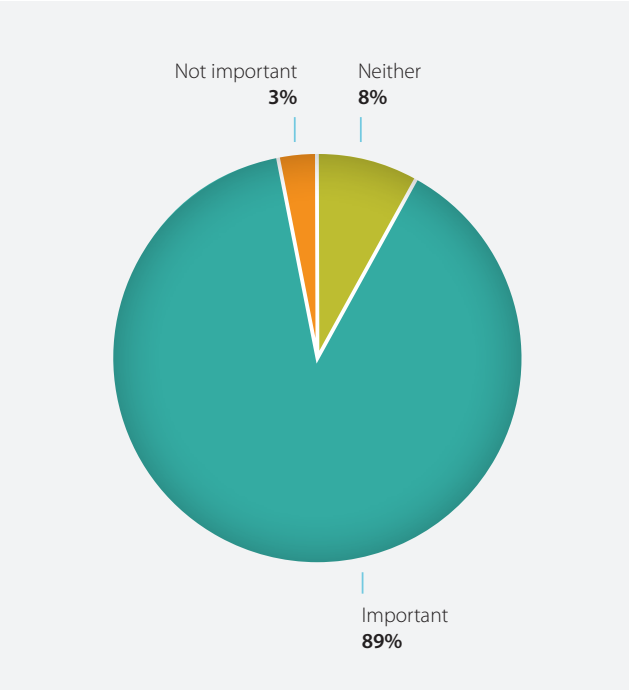


Figure 4: Importance of reducing water consumption



New water sources

In the community attitudes survey, catchment management received the highest support as a future water supply option with 88 per cent support, marginally above dams with 83 per cent. Seawater desalination and groundwater were well-supported with 75 per cent and 62 per cent respectively.

When asked, nearly two-thirds of respondents would like to see the allocation of groundwater to the local drinking water supply.

Verbatim comments from the survey indicate that some community members may not be aware that catchment management refers to a range of forestry practices to return the forest to a more mature and natural state that will use less water.

The figures also show there was not enough information provided about water trading.

"We have more groundwater than we know what to do with, and we don't have any worthwhile rivers in the South West."

(Phone survey participant)

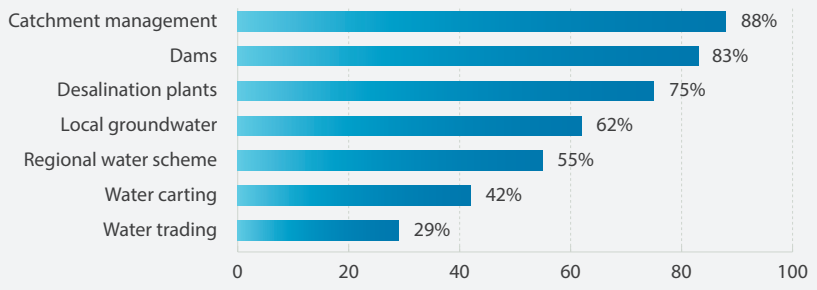
"We do have a high amount of rainfall and a lot of area where we could build dams. I do not think it's hard to build more dams."

(Phone survey participant)

"I think [desalination] is the way of the future. We are taking too much water out of the ground, dams can't keep up with demand. Desalination is the answer."

(Phone survey participant)

Figure 6: Support for future water supply options



Water use efficiency

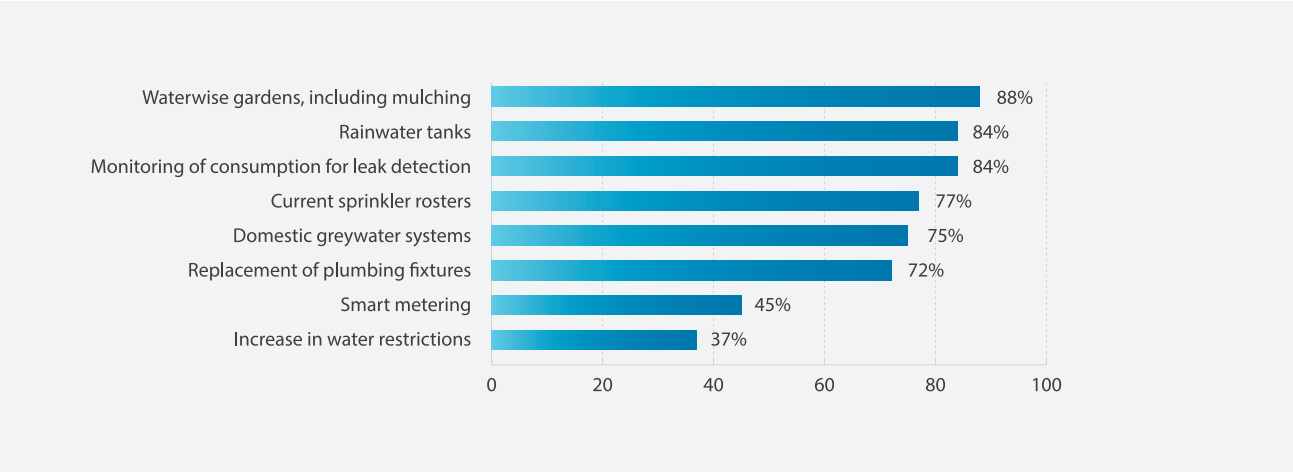
Our customers in the South West are committed to water conservation, recording some of the lowest water use per person in the state. This was reinforced in the community attitudes survey with many customers stating that they already engage in water efficiency behaviours and would consider adopting other behaviours to become more efficient.

With nearly all participants agreeing it is important to reduce water consumption, the support for various water efficiency measures is very high, particularly for waterwise gardens, rainwater tanks and leak detection.

The response to an increase in water restrictions (above the current sprinkler roster of two watering days per week) was divided, with support from only 37 per cent of participants.

The survey revealed a lack of community awareness about smart metering, with 30 per cent of respondents stating 'don't know' when asked if they supported this as a water use efficiency measure. As this is a new technology that has not been trialled with our South West customers, this is not a surprising result.

Figure 5: Support for water efficiency measures

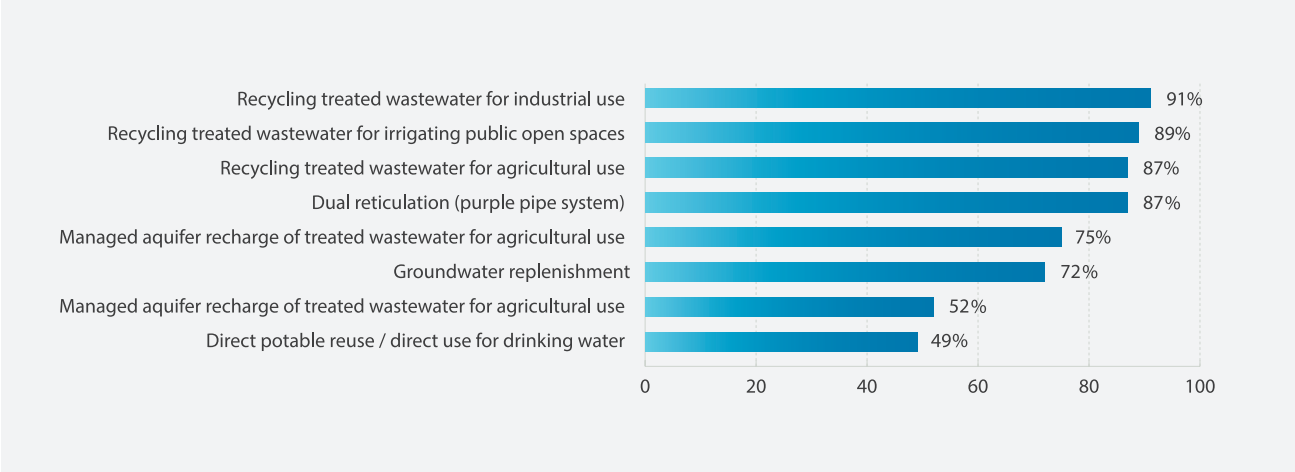


Water recycling

Support for water recycling is generally high, especially for industrial use, public open space, agricultural use and dual reticulation (for household gardens and toilet flushing).

This support was consistent across all regions and was consistent with informal feedback provided at information sessions and displays. We currently recycle wastewater from 11 of our 16 wastewater treatment plants across the South West. Across Western Australia, more than 21 billion litres of treated wastewater is recycled every year.

Figure 7: Support for water recycling options



Appendices

Appendix I — List of stakeholder briefings

We provided one or more briefings on the *Water Forever: South West* project to:

Aboriginal community
- South West Boojarah
- Gnaala Karla Boodja

Aqwest

Augusta Community Development Group

Bunbury Wellington Economic Alliance

Busselton Water

Conservation Council of Western Australia

Department of Environment Regulation

Department of Parks and Wildlife

Department of Planning

Department of Water

Eaton Probus Club

Environmental groups
- Busselton Dunsborough Environment Centre
- Busselton Naturaliste Club
- Cape to Cape Catchment Group
- Friends of the Yarragadee
- Margaret River Environment Centre
- South West Catchments Council

Environmental Protection Authority

Local Government Authorities
- City of Bunbury
- City of Busselton
- Shire of Augusta Margaret River
- Shire of Augusta Margaret River councillors
- Shire of Bridgetown-Greenbushes
- Shire of Capel
- Shire of Capel councillors
- Shire of Dardanup
- Shire of Manjimup
- Shire of Manjimup councillors
- Shire of Nannup

Media
- Augusta-Margaret River Times
- Donnybrook–Bridgetown Mail
- Manjimup-Bridgetown Times

South West Development Commission

Water Corporation, South West regional staff

Appendix II — Summary of formal submissions

Bunbury Wellington Economic Alliance

The Bunbury Wellington Economic Alliance supports the investigation and consideration of all the potential options presented for *Water Forever: South West* and expects that improved water use efficiency, identifying additional water sources, and water recycling will all be features of a long-term strategy to secure water supplies in the South West.

They note the success of the Water Corporation in recent years of moving to the climate independent water source option of desalination, as opposed to reliance on dams.

Resident of Bridgetown

This Bridgetown resident's submission promotes the need to think about water resources holistically. His detailed submission includes:

- alternatives to the current thinking on deep sewerage including maximising the use of existing leach drains and harvesting phosphorous from wastewater for fertiliser
- opportunities for increased domestic and commercial water harvesting and storage in particular rain water
- consideration about the effect of land management (in particular tree planting) on rainfall, and
- the need for increased resources for research and development into agriculture to help farmers adapt to climate change and drier conditions.

Resident of Dunsborough

This submission from a Dunsborough resident acknowledges the work already undertaken on greywater reuse in Dunsborough and proposes:

- Recycled water to be included as a water option for Dunsborough with previous reports by the City of Busselton on recycled water reuse in Dunsborough being made available to the public.
- Recycled water use made a priority on public open space in Dunsborough.
- Dual reticulation to be used in a future primary school and public sporting facilities, including for use in toilet systems.
- A feasibility study be undertaken comparing micro-desalination along the Leeuwin Naturaliste Park with recycled water use from the Dunsborough Wastewater Treatment Plant.

Shire of Nannup

The Shire of Nannup relies heavily on agricultural, timber and environmental/tourism industries. With a considerable proportion of the shire consisting of state forest vegetation, agricultural use and plantations, the demand on water from the Leederville Aquifer is considered high.

The Shire of Nannup expressed concern that any increased allocations (for groundwater licences) may have an even greater effect on its shire, and requested that they be included in future decisions affecting its water future.

In particular, it suggested that a baseline reading for the Blackwood River must be more clearly understood before any further increase in allocations is proposed.

It also noted that the considerable change in rainfall in recent years needs to be understood and factored into any future proposals, and that the efficiency of infrastructure across the region must be ensured.

The shire supported the *Water Forever: South West* project's emphasis on water recycling, reducing water use and finding additional water sources.

Shire of Manjimup

The Shire of Manjimup's submission included requests for the following to be considered:

- Improving water holding performance of the Phillips Creek Dam.
- Improving the water pipe infrastructure within Manjimup to provide water at an adequate pressure.

The shire queried:

- the justification and intention for the alternative groundwater source for Pemberton located near the Donnelly River, and
- the proposed micro-seawater desalination plants near Windy Harbour, given the town's water supply is met from bores and there is no reticulated power.

It noted that water carting to Northcliffe and Quinninup is not supported by some members of the community, and it does not support keeping proclaimed drinking water restrictions over the Quinninup Dam.

The shire also requested that the Water Corporation conduct a comprehensive investigation of groundwater south of Northcliffe.

The shire's other comments regarding the Manjimup Wastewater Treatment Plant and a proposed innovative hybrid reticulated/septic treatment of wastewater for Northcliffe are outside the scope of this project, but will be responded to directly.

At the stakeholder briefing given to the shire's council, they indicated their desire for additional dams.

Appendix III — Communication tools

Webpage

We dedicated a page on our website to the *Water Forever: South West* project. Located under 'Solutions to regional water supply', the page included (at various stages of the project):

- overview of the project
- facility to register for updates
- facility to complete survey form
- promotion of community information venues and times
- information sheets on water supply schemes in the region
- project updates
- email contact, and
- background documents.

The webpage address, watercorporation.com.au/waterforeversw was included in all communication materials.

Information materials

We developed the following information materials to support our engagement activities:

- 'Register Your Interest' brochure
- 'Potential Water Options' brochure
- Information sheets – Potential options
- Information/fact sheets – Water supply schemes
- Display stands
- Registration form
- Survey form

Media

As part of the project, we advertised in several regional newspapers to promote the following:

- *Water Forever: South West* project launch held in Margaret River on 16 August 2013.
- Community displays held in Collie, Eaton, Dalyellup, Dunsborough, Margaret River, Pemberton, Manjimup, Bridgetown, Nannup and Greenbushes.
- Public Forum held in Margaret River on 17 October 2013.
- Community workshops held in Busselton on 23 November and Nannup on 30 November 2013.
- 'Teaser' questions to encourage ideas and comments from the community.

During the community engagement phase, the project received media coverage following the launch and in relation to the community displays and calls for feedback.

Community updates

We provided regular email updates to stakeholders and community members who had subscribed, and published a project update on our webpage in January 2014.

Selection of media articles on *Water Forever: South West*

Chance to influence water supply future

RESIDENTS across the South West are being asked for their input into a long-term public water supply plan for the region.

Water Forever: South West plans the future of water and wastewater services across the region in the face of a drying climate.

Mr Redman said the community consultation would include a direct mail-out to residents of all towns serviced by the Water Corporation to register interest in taking part, information booths in local towns and online surveys to collect community ideas and feedback. A draft report will be released next year for further con-

Water agency set to outline 50-year plan

Those interested in the sustainable water debate and the future of the South West Yarragadee are invited to a forum on Thursday.

Friends of the Yarragadee spokeswoman Melina Maro said it would be residents' chance to hear the Water Corporation outline scenarios about its 50-year water plan, with strong local interest following a similar forum in Busselton last month.

"Channels of open communication, transparency and accountability between water management entities and local communities as stakeholders are being forged in an unprecedented way," Ms Maro

Corporation to address water needs

THE Water Corporation will have a booth outside Reubens Newsagency in Forrest Street today and Saturday from 10am-2pm where residents can have their say on water needs in Collie.

Water Forever: South West is the Water Corporation's plan for the future of water and wastewater services acros

Water Minister Terry Corporation would talk w South West over coming water sources, reducing w cling options.

"I urge people in the v

Input wanted for water plan

SOUTH West residents are being asked for their input into a long-term public water supply plan for their region.

Water Forever: South West is a plan for the future of water and wastewater region in the face

last week, water

Corporation would talk with customers over coming months about plans for water sources, reducing water use and water recycling options.

Information booths will be set up in Dalyellup, Eaton and Collie from September to November 2013.

To register interest, go to watercorporation.com.au

Water worries for South West

SOUTH West water planning consultations have led to the re-activation of the Friends of the Yarragadee network.

The Water Corporation has started community consultations for their 50-year Water Forever plan in some towns in the South West region.

Friends of the Yarragadee have re-formed to encourage communities to be proactively present and are holding a public forum.

The Water Corporation has stated decisions around future recycling, reducing and new water sources are being driven by what the communities want.

"We aim to make the Water Forever consultations an inspiring example of what good community consultation can be," Friends of the Yarragadee spokesperson Melina Maro said. "We wish to understand how Water Corp's decision-making model will look so that it truly reflects the voices and priorities of the people."

South West communities banded together in 2006 to fight the Water Corporation's proposal to pump 45 gigalitres per year from the Yarragadee Aquifer for Perth's water supply.

The Friends of the Yarragadee formed as a collaboration between community members, indigenous and environmental groups and farmers and resulted in a change of plan, with the government building a desalination plant instead.

The Water Forever consultation sessions are designed to gather the input of community members and community stakeholder groups.

The planned consultation sessions involve online and on-street surveys, presentations to "key stakeholders" and feedback sessions once the plan is drafted.

"We think the consultation sessions could be better designed," Margaret River Regional Environment Centre's co-ordinator David Rastrick said.

"There is much expert knowledge in the community that could be gathered through early face-to-face group consultations."

To join the Friends of the Yarragadee, please contact Melina Maro on 9757 0212.

Water Corporation's community consultation for Nannup will be outside the post office between 10am and 2pm, October 24 and 26.

"I urge all residents to please contact Kathyrn Heaton of the Water Corporation on 0419 916 665 to register their interest in attending a 'stakeholder briefing' in Nannup," Nannup organic farmer Bee Winfield said.

"Here on Thomas Road, the

sound of frogs has been drowned out (or do they just not sing and play the banjo anymore?) by the Yarragadee bore pump going co tinuously through August and into September," she said.

"We know Water Minister Ter Redman has promised Manjim people their two town dams will kept at 50 per cent capacity at times using "ground water sour from Nannup."

In answer to my enquiries as why the pump is running in the mi die of the wettest winter in 10 or years, the Water Corporati claimed on August 10 Manjimup dams were only at 37 cent capacity.

"This project was based on Wa Corporation's flawed notion that Yarragadee is a confined aquifer.

"Pete Lane, geologist, points that it is not a confined aquifer, linked to the Blackwood River to the Leederville aquifer that environment and bores rely on.

"Officials have failed to respo to Mr Lane on this issue.

"Nannup, this is your chance demand low energy solutions will not further contribute to clim change."

Water conservation a must

By ZANNIA YAKAS

THE future of water supplies in Collie and the South West, including the potential to recycle wastewater, will be put under the microscope in a series of information sessions for local residents.

The sessions have been called by the Water Corporation in response to concern about an increasingly dry climate in the South West.

Minister for Water Terry Redman recently announced a scheme which would see Perth's wastewater recycled and pumped back into the Perth underground aquifer.

When the scheme is ramped up to full capacity it could deliver enough water each year to fill Patersons Stadium seven times over.

Water Corporation's Scott Moorhead said everyone in the South West would be involved in developing their own water plan, Water Forever: South West. "We don't want it to be a surprise," he said.

"We want the community to come up to us (and say) what the issues are."

It includes residents from Collie, Margaret River, Manjumup, Pemberton, Greenbushes, Nannup, Dunsborough, Dalyellup and Eaton.

A draft report will be released early next year for further consultation, with the final report to follow later in the year. To register interest in the program, go to watercorporation.com.au

Glossary

Aqwest

The trading name of the Bunbury Water Corporation which is the water utility responsible for supplying water to Bunbury residents.

Busselton Water

The water utility responsible for supplying water to Busselton residents.

Catchment management

Catchment management includes a range of forestry practices to return the forest to a more natural state that will use less water and therefore improve streamflow and runoff. The treatments can include selectively removing trees, controlling re-growth, replacing exotic trees with native species, and prescribed burning.

Dams

Local rivers or streams impounded for long-term water storage.

Department of Water

A department of the Government of Western Australia responsible for managing the availability and quality of water sustainably (see water.wa.gov.au).

Desalination

Seawater is treated to remove salt and other minerals making it suitable for drinking.

Department of Parks and Wildlife (DPAW)

The state Department of Parks and Wildlife protects and conserves Western Australia's natural environment on behalf of the people.

Direct potable reuse

Treated wastewater is further treated to drinking water standards and supplied directly to a drinking water supply system.

Dual reticulation

Non-drinking water is provided to new developments through an additional pipe system used for non-drinking water uses such as toilet flushing or landscape and public open space irrigation. Also known as a purple or third pipe system.

Greywater

Household wastewater that comes from the bath, shower, washing machine, dishwasher and sinks.

Greywater system

A system installed to take household wastewater, excluding from toilets, and reuse it for non-drinking water uses, typically garden irrigation.

Groundwater

Water sourced from underground aquifers, made up from (mostly) rain which trickles down through the rocks and soils and into aquifers.

Groundwater replenishment

The process where treated wastewater is further treated to drinking water standards and recharged into groundwater supplies. The water can then be stored and taken out some time later for further treatment and supply to a drinking water system

Leak detection

Monitoring water usage to identify leaks. It can be done at a household level by monitoring the water meter overnight. On a larger scale, water utilities can use data logging to detect leaks in customer water systems, and techniques such as flow meter testing to find leaks in pipelines.

Managed aquifer recharge

Water — including wastewater, stormwater or rainwater — is purposefully re-directed into an aquifer.

Managed aquifer recharge for salt water intrusion

Highly treated wastewater is recharged into aquifers along the coast to create a 'water barrier' to prevent seawater from seeping into the less saline groundwater.

Managed aquifer recharge for industry or agriculture

Highly treated wastewater is recharged into aquifers allowing it to be taken out later by industry and/or agriculture.

Potable water

A term used for water that meets drinking water standards.

Public open space

A generic term used to describe parks, golf courses, playing fields and other recreation areas, particularly in relation to water recycling.

Purple pipe system

See 'dual reticulation'.

Rainwater tanks

Tanks used domestically to collect rainwater, used either as the primary or supplementary source for household water supply.

Retrofits

Existing plumbing products, such as shower heads, single-flush toilets and irrigation controllers, which do not meet Water Efficiency Labelling and Standards (WELS) are upgraded with products that are WELS rated.

Salt water intrusion

The movement of denser, salty water into fresher water which is less dense. It typically occurs along coastlines and can occur in surface and groundwater systems.

Seawater desalination

Seawater is treated to remove salt and other minerals making it suitable for drinking.

Smart metering

Advanced metering units are installed to enable more frequent and remote monitoring of water use and early detection of leaks at properties.

Third pipe system

See 'dual reticulation'.

Water carting

Drinking water is transported to small towns by truck when local sources are unavailable or inadequate.

Water restrictions

Sprinkler bans to limit the use of automated irrigation in spring, summer and autumn.

Water trading

The buying and selling of tradeable water rights between licensed water users, allowing it to be redistributed. In Western Australia, water trading is regulated by the Department of Water.

Contact details

Tel: (08) 9725 5148 or (08) 9420 2912
Email: sw.waterforever@watercorporation.com.au
watercorporation.com.au/waterforeversw

ISBN 1 74043 857 4 March 2014
This information is available in alternative formats on request.

Building the LOWER HUNTER *water* PLAN

a discussion paper

NSW GOVERNMENT | Metropolitan Water Directorate

"Water is amazing and important. It brings life to the earth and keeps us alive."

– Kitty, age 8
community consultation workshop 2013

Contents

Foreword

It is vitally important that the lower Hunter region has an effective plan for meeting its future water supply needs. The plan needs to be based on a solid understanding of expected water use into the future. It needs to be robust and able to respond to severe droughts that could test the system. It also needs to be flexible, so we can adapt to new information on issues like climate change, new technology, population growth and business activity.

The NSW Government established the Independent Water Advisory Panel in 2012 to provide independent strategic and technical advice on urban water planning for the lower Hunter and greater Sydney regions.

The Panel has been closely involved in independently reviewing the work leading to this discussion paper, and has been able to use its expertise and local knowledge to advise the Metropolitan Water Directorate on aspects of urban water planning, hydrology, economics, river health and community engagement.

We look forward to your feedback on the portfolios outlined in this paper.

Chris Davis (Chair)
Independent Water Advisory Panel

On behalf of the Panel

Prof George Kuczera
Dr WEJ Paradice
Ms Kylie Cochrane
Mr Ross Chapman
Prof Cynthia Mitchell
Dr Tony Church

Introduction

The lower Hunter is the seventh largest urban area in Australia, and one of the State's major centres of economic activity. The population will continue to grow as people are attracted to the region's lifestyle and employment opportunities.

The Metropolitan Water Directorate is leading a whole-of-government approach to develop the *Lower Hunter Water Plan* in close consultation with Hunter Water, other government agencies and the community.

The objectives of the *Lower Hunter Water Plan* are to identify measures to:

- provide water security during drought
- ensure reliable water supplies to meet growing water demand due to a growing population and increased business and industry activity
- help protect aquatic ecosystems
- maximise net benefits to the community.

The region's water supplies perform well in average climatic conditions, but the storages are relatively small and prone to natural losses like evaporation. A major focus of the *Lower Hunter Water Plan* is on being prepared with a range of measures that can be put into place at the right time if the region experiences a severe drought.

The *Lower Hunter Water Plan* will identify a mix of supply and demand measures that we call 'portfolios'. The portfolios presented in this paper have been tested against a range of possible droughts to make sure they can supply enough water when it is needed.

The portfolios being considered have some differences in their environmental, social, economic and risk features. It is important to incorporate community feedback on these features as we build the plan.

You can provide your feedback on the portfolios outlined in this paper by:

- attending a workshop
- making a written submission
- participating in an online forum at

www.haveyoursay.nsw.gov.au/lowerhunterwaterplan

About this discussion paper

This paper presents six potential 'portfolios' (or combinations of supply and demand measures) that could meet the objectives of the *Lower Hunter Water Plan*. It outlines how these portfolios were developed and some possible trade-offs among them.

Most importantly, it invites your feedback so that community and stakeholder views are represented in the final *Lower Hunter Water Plan*.

Setting the scene

Understanding water sources in the lower Hunter

The lower Hunter's water supply meets the needs of over half-a-million people. Water is drawn from two main surface water sources – Chichester Dam and Grahamstown Dam – together with groundwater from the Tomago and Tomaree sandbeds.

While there is some flexibility in having multiple water sources, some of these sources can experience high natural losses, especially during drought.

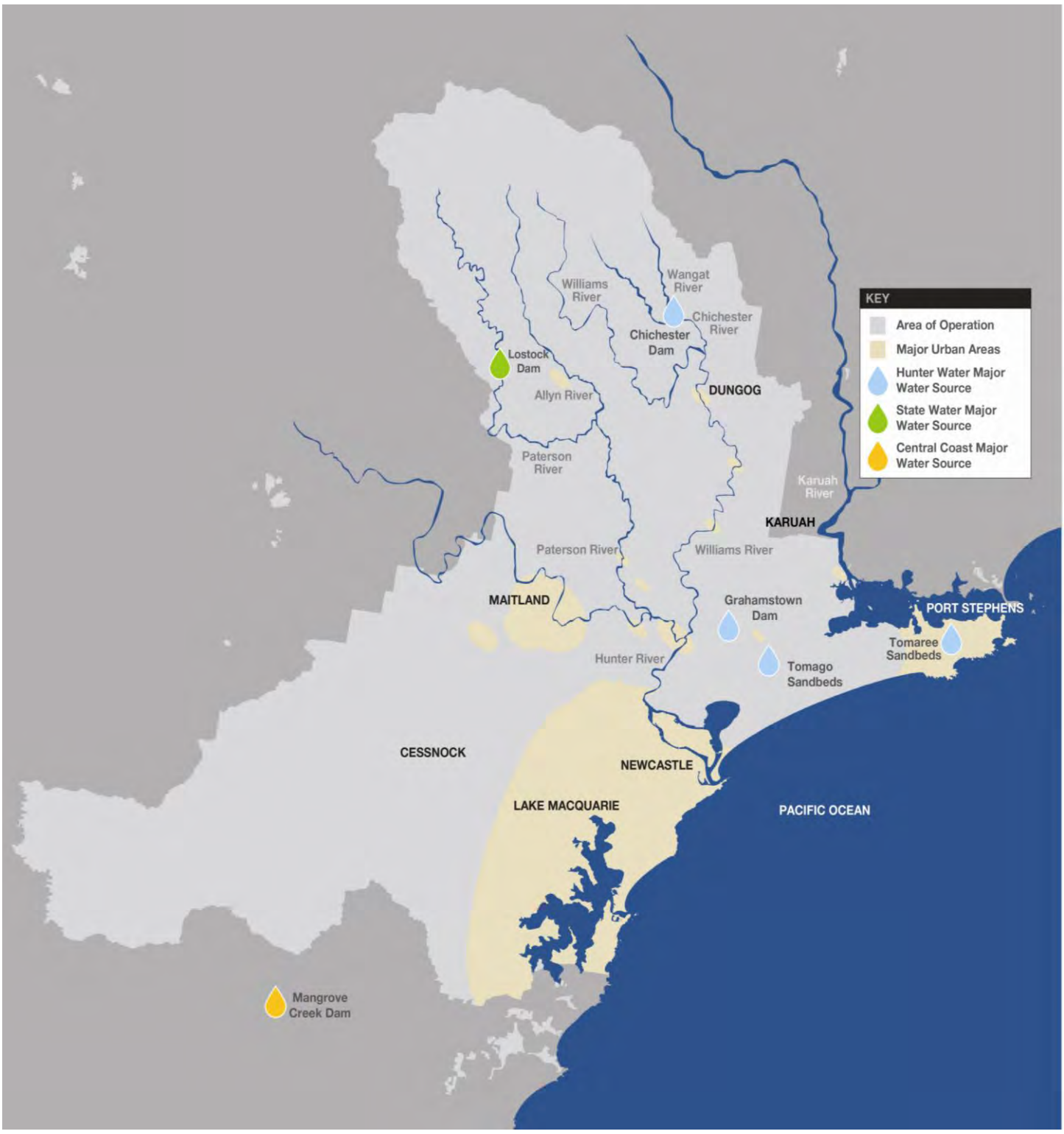
Chichester Dam, next to the World Heritage-listed Barrington Tops, readily 'fills and spills' because the dam is relatively small compared to the size of the catchment.

Grahamstown Dam is an off-river storage filled by pumping from the Williams River. It also collects run-off from its own catchment and rainfall on its surface. The dam is shallow with a large surface area. In a hot dry summer it can deplete very quickly, losing as much water from evaporation as it supplies to meet customer demands (about 200 million litres per day).

The coastal Tomago Sandbeds also have a large surface area and a relatively shallow water table, generally less than five metres below ground level. Natural losses occur via seepage, direct evaporation and evapotranspiration through plants using the water.

Chichester Dam

Lower Hunter Water Plan – region and key features



Predicting water supply and demand

In planning for our future water needs, the first thing we need to do is define how much water we need (the *demand*) and how much water we have available (the *supply*).

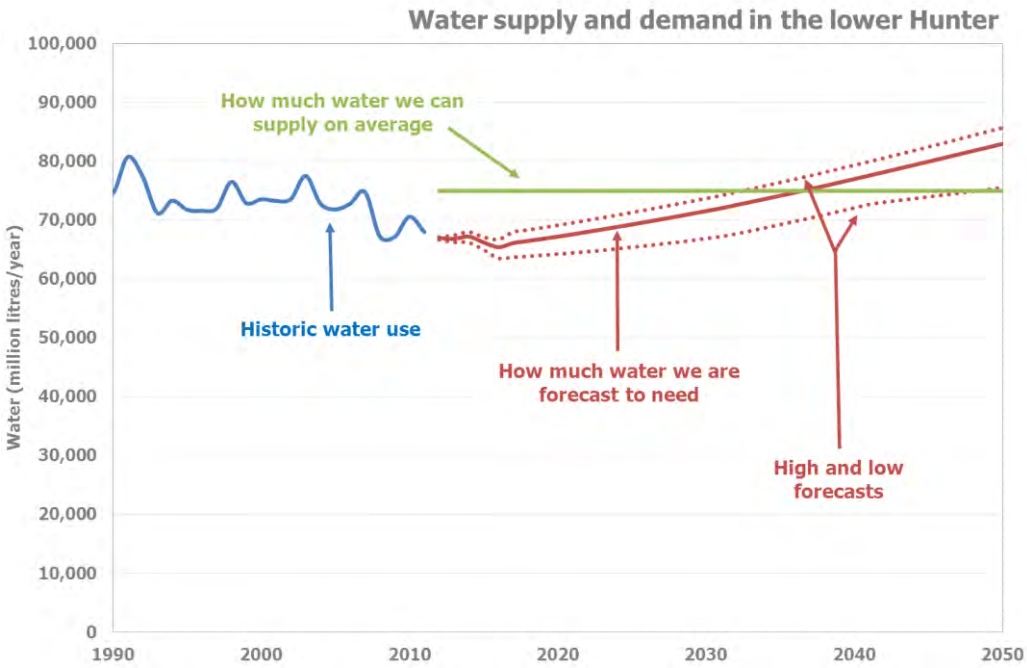
How much water we need

The demand forecast is one half of the supply-demand balance. The demand forecast estimates how much water customers are likely to use in future years. A model uses historic trends together with predictions about population growth, business trends and the ongoing uptake of water-efficient appliances to forecast future water use.

The latest demand forecast is based on a best-practice model developed for the National Water Commission. The model forecasts low growth in demand for the next 30 years, with demand expected to remain between around 65 billion and 80 billion litres of water per year.

This represents a best estimate or 'base case' forecast. Since we have to estimate what might happen in the future, we can vary the assumptions in a process called 'sensitivity analysis' to produce higher and lower forecasts. For the *Lower Hunter Water Plan*, the sensitivity analysis modelled variations in population and connection forecasts, major customer behaviour, residential water efficiency and behavioural change, non-residential water efficiency, pricing, and climate change.

The graph below shows the resulting band of possible future water demands, either side of the base case forecast (see pages 13 and 14 for more information on the base case).



How much water we can supply

The volume of water that can reliably be supplied each year in the lower Hunter is calculated by modelling how the water storages behave under different climatic conditions over the long term. The mathematical model takes into account the existing water supply system, operating rules, and forecast water demand.

The model is also used to calculate how much water the storages can supply each year on average for agreed service levels *(see page 7 for more information on service levels)*.

The modelling indicates that the lower Hunter storages can currently supply an average of 75 billion litres of water each year, which is enough for the next 20 years or so under normal conditions (as shown by the green line in the graph).

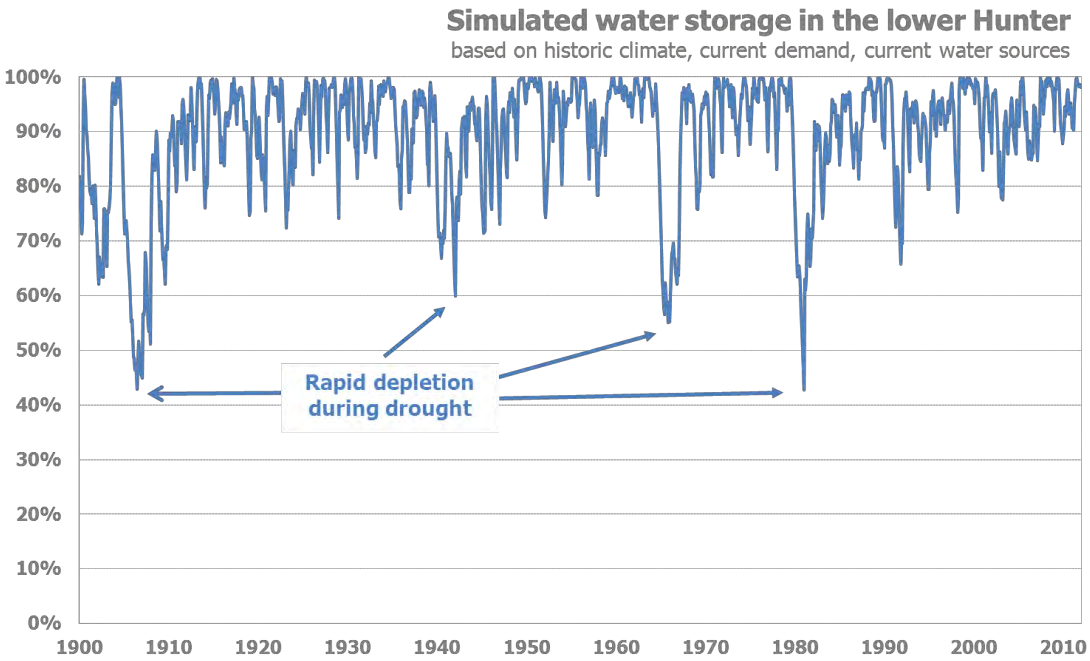
Planning for drought

The supply and demand modelling indicates the region's existing water sources perform well in average conditions. However, while the lower Hunter has enough water to meet the average needs of our growing region in the short to medium term, we also need to plan for periods of drought.

The impact of drought on the region's water supply is shown in the graph below, where significant droughts occurred in the 1900s, 1940s, 1960s, 1980s and 1990s. Strategies to improve water reliability at these times included water restrictions, new sources of supply, and user pays pricing to reduce demand.

The region was fortunate to escape the worst of the drought in the 2000s, which impacted most of New South Wales. This was due to a series of 'east coast lows' which delivered significant rainfall that replenished our storages. However, Hunter storages can drop rapidly during a drought as they are generally small or shallow, and experience significant natural losses from evaporation.

Therefore the most pressing need, and the primary focus for the *Lower Hunter Water Plan*, is to improve drought security.



Service levels for drought security

In preparing for drought, water planners must balance the community's needs against the cost of additional sources of water which may only be needed occasionally. The social and environmental costs must be considered as well as the financial costs.

For many drought situations, water restrictions may be a cost-effective approach to provide short-term protection against running out of water. The community's acceptance of restrictions is an important consideration.

Water planners therefore design water supply systems to meet agreed drought security service levels. These are designed to minimise the risk of running out of water during droughts, and set limits on how often (frequency) and for how long (duration) the community experiences drought water restrictions.

Based on a study of other water utilities in Australia, the proposed service levels for the *Lower Hunter Water Plan* are:

- the average frequency of drought restrictions is not more than once every 10 years on average
- the average duration of drought restrictions is not more than five per cent of the time
- the chance of water storages approaching empty (defined as 10 per cent total storage level) is not more than once in 10,000 years.

These service levels were used to estimate how much water our sources can supply over the long term. The portfolio modelling has also considered more conservative levels of security, as it is important to have a contingency plan to ensure we can make it through a more severe drought than we might expect from our relatively short climate record of around 100 years. This is reinforced by recent experience in Sydney and the Central Coast, where the 2000s drought lasted much longer than previous droughts recorded in those regions.

What about climate change?

We know that our climate and rainfall are highly variable, and that the impacts of future climate change are still unclear. It is therefore important that the *Lower Hunter Water Plan* considers these uncertainties using the best information available now, together with sensitivity analysis.

The Metropolitan Water Directorate is involved in a number research projects related to the potential impact of climate change on rainfall and runoff and how that may affect future water security for the metropolitan regions of NSW.

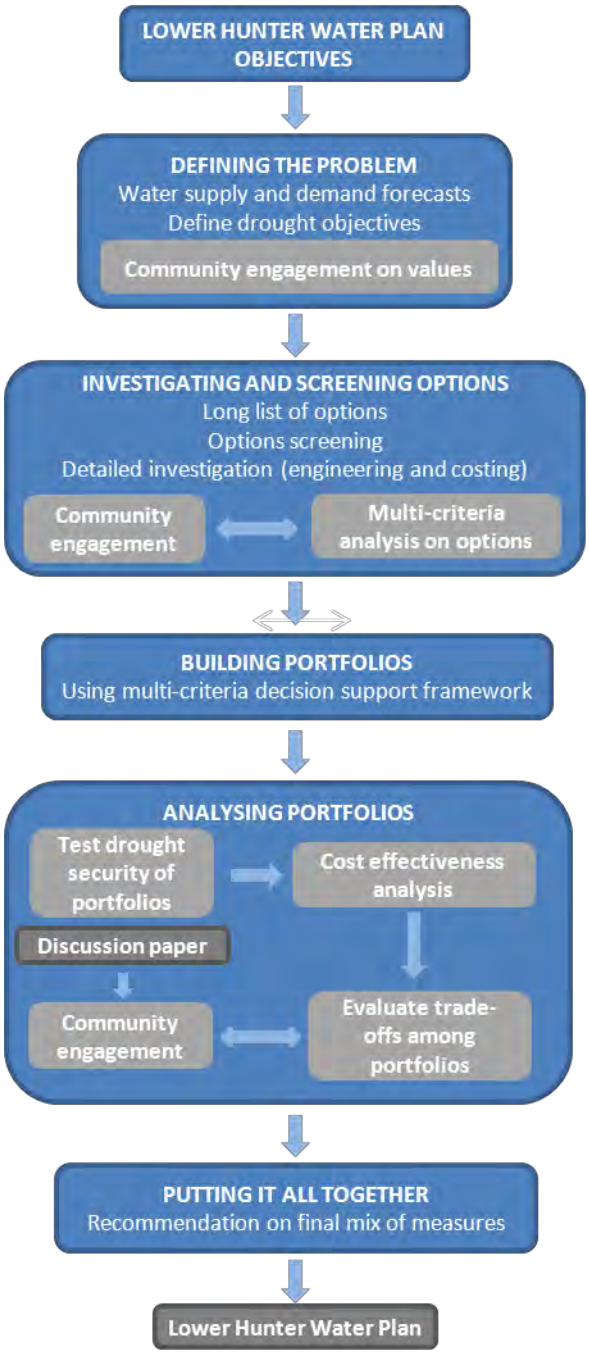
As climate predictions for these regions continue to improve, the latest research findings will be included in the water supply modelling.


Grahamstown Dam

Building the plan

The planning process for the *Lower Hunter Water Plan* is based on the National Urban Water Planning Principles that have been adopted by all Australian governments *(see box at right below)*.

The steps in the planning process are shown in the diagram below. Central to the process are the steps that support the decision on the final portfolio, or mix of measures, for the *Lower Hunter Water Plan*. This is referred to as the 'decision-making framework'.



National Urban Water Planning Principles

National principles for urban water planning should be universally applicable when developing plans to manage the supply/demand balance of a reticulated supply for an urban population.

Key principles to achieve optimal urban water planning outcomes are:

1. Deliver urban water supplies in accordance with agreed levels of service
2. Base urban water planning on the best information available at the time and invest in acquiring information on an ongoing basis to continually improve the knowledge base
3. Adopt a partnership approach so that stakeholders are able to make an informed contribution to urban water planning, including consideration of the appropriate supply/demand balance
4. Manage water in the urban context on a whole-of-water-cycle basis
5. Consider the full portfolio of water supply and demand options
6. Develop and manage urban water supplies within sustainable limits
7. Use pricing and markets, where efficient and feasible, to help achieve planned urban water supply/demand balance
8. Periodically review urban water plans

http://www.environment.gov.au/water/policy-programs/urban-reform/nuw-planning-principles.html

The decision-making framework

A range of important inputs and tools are being used to help develop the portfolio of supply and demand measures (or options) for the *Lower Hunter Water Plan*. These include modelling to understand the water supply and demand (discussed in the previous section) as well as:

- technical investigations and costing of options
- community and stakeholder input
- modelling to test whether portfolios can provide enough water
- specific tools to analyse the cost, social, environmental and risk factors in the evaluation of portfolios.

The key tools are described below.

Analysis tools

Choice modelling

Choice modelling is a survey tool that allows researchers to estimate the value people put on social and environmental costs and benefits.

For the *Lower Hunter Water Plan*, a choice modelling study asked a large sample of people whether they would be willing to pay extra on their water bill to reduce the likelihood, severity and duration of water restrictions for all households. This allowed us to estimate the community's willingness to pay for improving water supply availability during drought. The results were an input to the cost-effectiveness analysis of portfolios.

Cost-effectiveness analysis

Cost-effectiveness analysis is an economic tool used to compare alternative options for meeting the same objective.

For the *Lower Hunter Water Plan*, cost-effectiveness analysis will be used to compare water supply and demand portfolios that achieve water security objectives. The analysis focuses on the total costs to society (including costs to the water utility, businesses and the community) of each portfolio.

Multi-criteria analysis

Multi-criteria analysis is a decision-making tool for complex problems that have more than one objective. It is useful where costs and benefits cannot be readily measured in dollar terms.

For the *Lower Hunter Water Plan*, multi-criteria analysis is being used to ensure that the social, environmental, risk and financial impacts are adequately considered when assessing the options and portfolios against the objectives of the plan.

Investigating and screening options

At the start of planning for the *Lower Hunter Water Plan*, over 70 water supply and demand options were identified that could potentially contribute to securing the region's water supply.

This list was reduced using information from technical investigations and expert knowledge to consider the following questions for each option:

- Is the option technically feasible?
- Are the implementation risks manageable? (The risks considered included regulatory approvals, economic viability, social acceptability, lead times, and procurement/construction risks.)
- Can the capital and operating costs be ascertained with confidence?
- What will the option contribute to the water supply/demand balance?
- Is the option effective as a drought response?
- Are the environmental impacts known or assessable, and can they be managed?

Some of the options that were removed during this screening phase were less feasible than others, and included:

- raising Grahamstown Dam or Chichester Dam
- new dam options at numerous locations
- reducing evaporation from Grahamstown Dam using physical covers or chemicals
- accessing groundwater at North Stockton
- importing water by ship
- transporting recycled water from Sydney
- towing icebergs
- cloud seeding.

The options that advanced from this process were broad ranging and spanned seven categories of supply and demand measures, including:

1. water efficiency
2. demand management
3. stormwater capture
4. recycled water
5. surface water/inter-regional transfers
6. groundwater
7. desalination

The remaining options were further developed through engineering and other technical investigations to allow them to be included in the next phase of analysis for the *Lower Hunter Water Plan*.

The options are summarised in the table on the following page.

Water supply and demand options being considered for the Lower Hunter Water Plan

Category	Option	Description
Water Efficiency	Residential and non-residential water efficiency	Various programs (including education, audits and incentive schemes) to improve the efficiency of water use by both business and residential customers.
	Water loss minimisation	Reducing losses from Hunter Water's distribution system by active leak detection programs and pressure management.
Demand Management	'Water wise rules'	Simple, common sense actions that help conserve water. These are already in place in Sydney and the Central Coast.
	Drought restrictions	Applying restrictions when storage levels fall below a defined level. These generally focus on reducing outdoor and business water use.
	Voluntary water use targets	A way of encouraging further water conservation (including indoor uses) by setting a daily use target that the community is encouraged to achieve when drought restrictions apply.
Stormwater Capture	Stormwater harvesting and use	The capture of stormwater as a substitute for non-drinking water purposes such as irrigation of golf courses, parks and playing fields.
	Rainwater tanks	Rainwater harvested from roof areas of dwellings and other buildings and stored in privately owned tanks on site for non-drinking water uses such as garden watering and toilet flushing.
Recycled Water	Dual reticulation	Involves supplying recycled water through a separate pipe network for uses such as toilet flushing, outdoor watering and industrial applications.
	Greywater use	Involves separating and reusing the wastewater generated from washing machines, showers, baths and basins for uses such as outdoor watering.
	Decentralised recycling and sewer mining schemes	'Decentralised systems' involve the collection, treatment and reuse of wastewater at or near the point of generation. 'Sewer mining' is the process of tapping into a sewer to extract sewage, which is then treated and used as recycled water. In both cases, the recycled water could be used for non-drinking water purposes such as irrigating golf courses and playing fields or industrial applications.
	Industrial use of recycled water	Supplying additional industrial customers with recycled water for uses such as dust suppression, cooling water and wash-down, thus reducing the demand for drinking water.
Surface Water	Inter-regional transfers: Lostock Dam	The potential to purchase water from Lostock Dam and transfer it to the lower Hunter is under investigation, along with potential enhancements to the system. The volume of water available from this dam is not currently used to its full capacity.
	Inter-regional transfers: Central Coast	There is an existing pipeline linking the Central Coast and lower Hunter water supply networks, allowing drinking water to be transferred between the two regions. The feasibility of enhancing the existing scheme to provide greater water security for both regions is being investigated.
Groundwater	Deep Tomago groundwater	A potential 'emergency measure' could involve additional bores to access deeper water from the existing Tomago groundwater source.
	Other aquifers	A potential new 'lower Hunter alluvial' groundwater source is under investigation, near the confluence of the Paterson and Hunter Rivers.
	Mine water	The feasibility of accessing surplus water that flows into coal mines near Lake Macquarie is at an early stage of investigation.
Desalination	Temporary desalination facilities	Small portable desalination units could be used as a temporary source during a drought.
	Emergency desalination facility	A larger scale desalination plant could be constructed in a drought, but typically involves a long lead time for investigations, approvals, design and construction. The lead time could be reduced by undertaking 'readiness activities' in the shorter term, but any decision to construct a plant would not be triggered until a drought occurred.

Further information on these options is available in a series of information sheets that can be downloaded from the project website www.haveyoursay.nsw.gov.au/lowerhunterwaterplan

Involving the community and stakeholders

The values and priorities of the community and stakeholders are very important in developing the *Lower Hunter Water Plan*.

Community members and representatives from a range of stakeholder groups - including local councils, industry, community and environmental groups - were involved in three sets of workshops from December 2012 to May 2013. In addition to advertising open community workshops, a Representative Community Group was recruited by the Hunter Valley Research Foundation to represent a cross-section of the lower Hunter population.

The project's 'Have your Say' website has also provided information and a link to register for workshops, as well as an opportunity for the community to provide feedback online through a forum and surveys at www.haveyoursay.nsw.gov.au/lowerhunterwaterplan.

December 2012

In the first round of consultation, participants identified a set of community and stakeholder values about water planning *(see box below)*.

February 2013

The second round of consultation involved discussion about the latest demand forecast and the broad categories of supply and demand measures.

April/May 2013

In the third round of consultation, the short-listed options being considered for the plan (outlined on page 11) were discussed in more detail. Participants at each workshop provided feedback on the options as they explored the concept of portfolios by working in groups to develop 'sample portfolios' that reflected the community values.

Feedback from these workshops, along with technical information and expert input, was then used in the multi-criteria analysis to help the planning team rank the options.

Participants at community and stakeholder workshops

Community values for water planning

In addition to the overarching value of 'a process we can trust', the community values developed through the workshops were:

- sustainable solutions and water conservation
- a fair and affordable system
- safe, healthy water for all uses
- protecting the natural environment
- a secure reliable supply for all
- a strategic, balanced and adaptable plan
- investing dollars wisely

Water planning portfolios

A portfolio approach

The lower Hunter's current water supply system, which includes existing water saving programs, is called the 'base case'.

The *Lower Hunter Water Plan* will identify a mix of supply and demand measures for responding to drought that will be incorporated into a 'portfolio'. A portfolio is a set or sequence of water management measures, timings and rules.

The portfolios being considered for the *Lower Hunter Water Plan* will build on the base case. They are being developed so that water supply and demand measures can be put in place when they are needed (as dam levels drop) to make sure there is enough water to supply the community's needs during droughts.

Using portfolios, rather than individual options, recognises that a combination of options may be better than a single 'big bang' solution. It also recognises that demand and supply measures have differing characteristics, which when combined in a portfolio can provide a more flexible and resilient system.

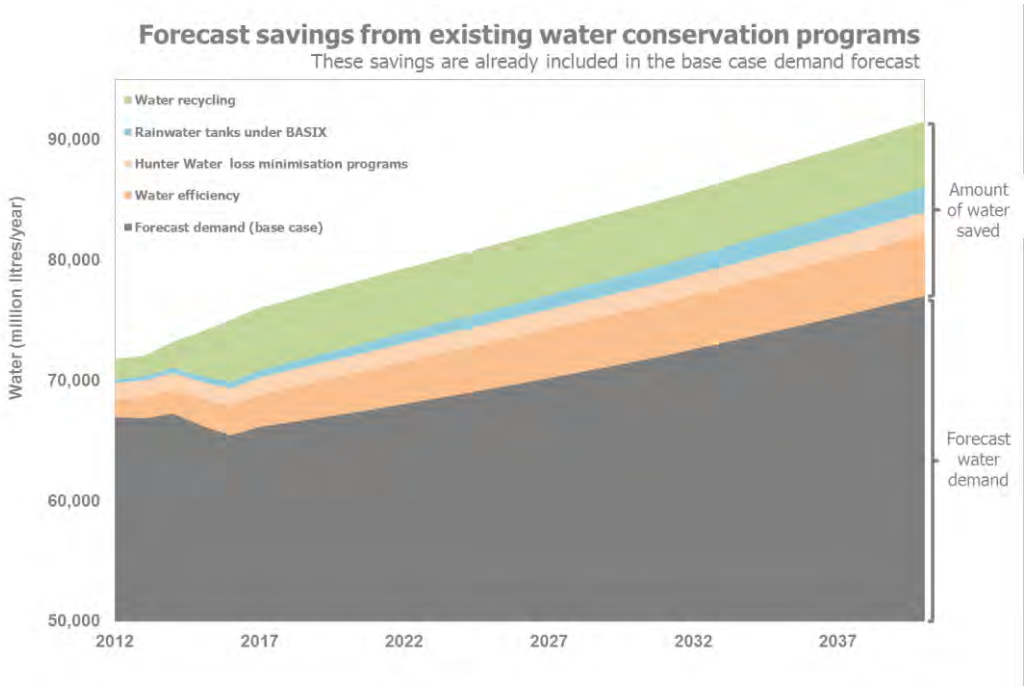
Understanding the 'base case'

The starting point for the portfolio analysis is the set of measures currently in place to meet the water needs of the lower Hunter – called the 'base case'. In addition to the existing water supply system, the base case for the *Lower Hunter Water Plan* assumes:

- rainwater tanks continue to be installed under the current BASIX rules for development approvals
- the current residential and non-residential water efficiency programs continue generating savings
- the current program of water loss minimisation continues, including active leak detection on a five year cycle and implementing three new pressure management zones by 2017
- Kooragang Industrial Water Scheme being commissioned by December 2014, producing nine million litres of recycled water a day suitable for industrial use
- dual reticulation schemes at Chisholm and Gillieston Heights providing recycled water to about 1000 properties as development proceeds
- no water restrictions in place
- no planned water transfers to or from the Central Coast
- environmental flows for Chichester Dam and Seaham Weir in line with water licences and approvals issued by the NSW Office of Water.

The base case recognises the efforts the people and businesses of the lower Hunter have already made to achieve significant water savings over the last decade through installing water efficient appliances, rainwater tanks and committing to use recycled water for suitable purposes.

These savings will continue and will increase into the future. This is reflected in the base case demand forecast as illustrated in the graph below. The significant increase in water recycling (green shaded area) is due to the planned commissioning of the Kooragang Industrial Water Scheme in late 2014.



Building portfolios

To identify the mix of measures that has the best prospects for delivering a cost-effective solution for the *Lower Hunter Water Plan*, we developed a number of potential portfolios.

To help build the portfolios, multi-criteria analysis (*see box on page 9*) was used to assess and rank each of the options against an agreed set of criteria relating to cost, social, environmental and risk factors. This comparison also helped identify trade-offs among these criteria.

The options were ranked using a combination of *quantitative* criteria, which can be measured with a number, and *qualitative* criteria, which use expert judgement or experience to rank the options against each other.

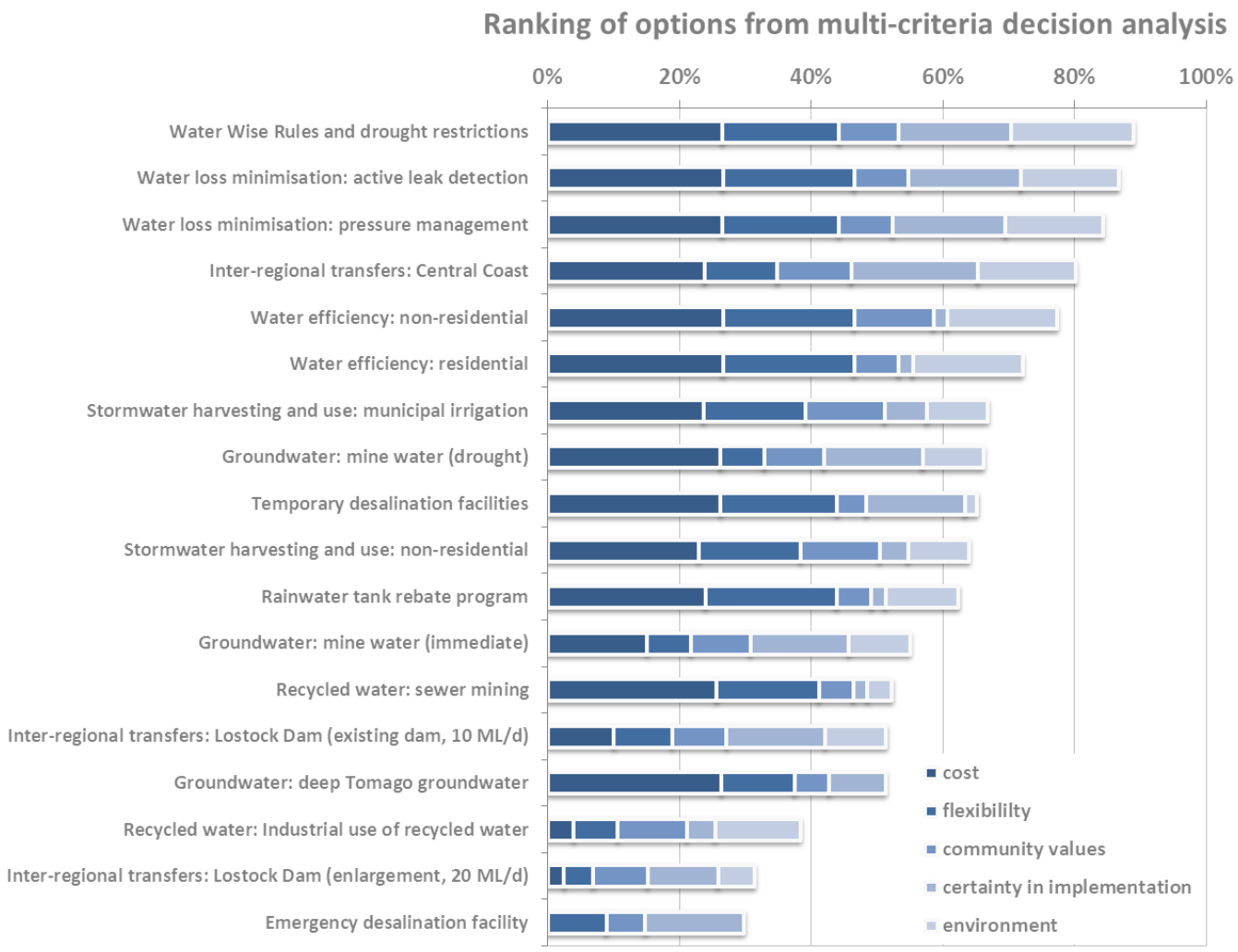
Multi-criteria analysis workshop with Institute for Sustainable Futures and representatives from government agencies

The multi-criteria analysis brought together expert and community input to help decide which measures to include in the portfolios and how best to combine them.

The criteria helped to distinguish between options by assessing:

- the cost to improve drought security
- the flexibility to respond to drought in stages or modules, without locking out other options in future
- how well the option reflects community values
- certainty in implementing the measure (eg, whether the option relies on someone else to take up recycling opportunities)
- the potential to impact on the environment.

The following graph shows how each option ranked against these criteria.



Analysing portfolios

Portfolios for the *Lower Hunter Water Plan* must be able to supply enough water when needed so that they can withstand severe droughts. Hunter Water's water source model was used to test the portfolios against many thousands of possible future weather scenarios, including some extreme droughts. A planning period of 15 years was adopted for the drought modelling based on expert advice and a realistic horizon for drought modelling.

The next stage of the analysis involved estimating the total costs of the portfolios using 'cost-effectiveness analysis' *(see box on page 9 describing analysis tools).* Inputs to this analysis included:

- the capital (upfront) and operating (ongoing) costs
- the volume of water supplied or saved
- the lead times for implementation of options within the portfolios.

In the next stage, the portfolios will be evaluated against the *Lower Hunter Water Plan* objectives to identify the portfolio that delivers the best social, economic, environmental and risk outcomes for the lower Hunter.

How ongoing community and stakeholder feedback will be used

The next series of workshops in September 2013 will provide an opportunity for community members and stakeholders to provide feedback on these portfolios. This information will be one input to the evaluation of portfolios to determine the final mix of measures to be included in the *Lower Hunter Water Plan*.

Artwork by Jasmine Sarin for the Department of Finance and Services to reflect the ways in which different departments, sectors, organisations and communities collaborate to address the issues faced by NSW Aboriginal people.

The Metropolitan Water Directorate is committed to further consultation with the Aboriginal community to ensure their cultural values and perspectives are included in the final *Lower Hunter Water Plan*.

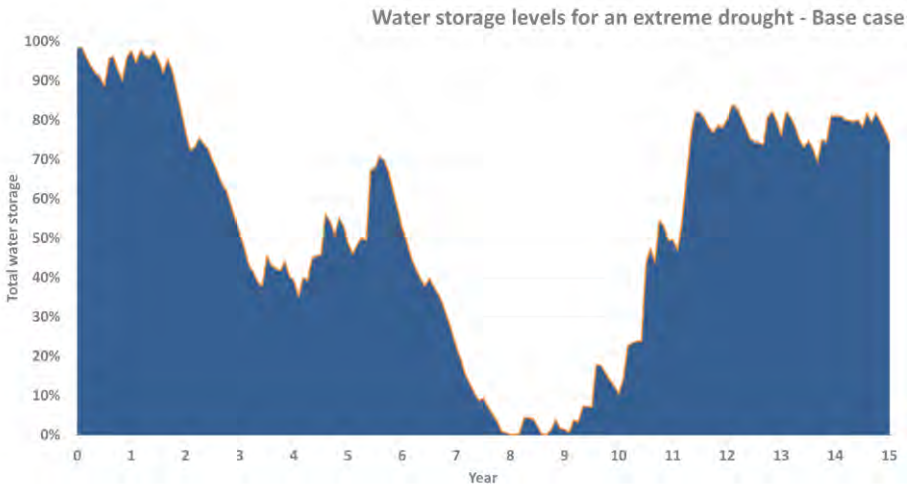
Comparing portfolios

The following pages outline six different water planning portfolios. Each portfolio contains a mix of measures that could provide a more secure supply of water to the lower Hunter community during drought compared with the current situation. The six portfolios demonstrate some of the potential trade-offs regarding cost, water security, and environmental impact.

The graphs illustrate the response of the portfolio to one of the most extreme droughts tested. The timing of such a rare drought is unpredictable and a similar drought may start tomorrow, in 10 years' time, or not for over 100 years. A range of droughts could occur in the future and the graphs are simply intended to illustrate the key points at which each measure would be put in place based on the changing water storage levels for this particular simulated drought.

The options included in each portfolio work in combination with the existing water sources and programs included in the base case discussed on pages 13 and 14. The water supplied and saved through these measures will be consistent across each portfolio as they will form the foundation of the *Lower Hunter Water Plan.*

The graph below shows how the **base case** would respond in drought. In this very extreme drought, the base case does not meet the aim of water storages staying above the level of ten per cent (near empty). On each of the following pages the orange line on the graph shows this base case and demonstrates how each portfolio compares with the base case in the same very extreme simulated drought.



Portfolio 1 consists of options that work on the demand side of the supply-demand balance. This set of six options ranked consistently high across all criteria in the multi-criteria analysis. These water conservation measures were considered important to include in **all** portfolios as they would underpin any drought response.

Portfolios 2-4 also include water transfers from the Central Coast, with or without other options such as stormwater use and temporary desalination. These portfolios were developed by adding different combinations of measures to boost the supply of water, selecting from the options with a medium-high ranking in the multi-criteria analysis.

Portfolios 5-6 also include accessing water from Lostock Dam as an alternative supply option. One portfolio uses water available from the existing dam by buying 'sleeper' (inactive) licences on the water market, while the other portfolio involves buying licences and also enlarging the dam so that more water is available when needed in a drought.

Understanding portfolio 1

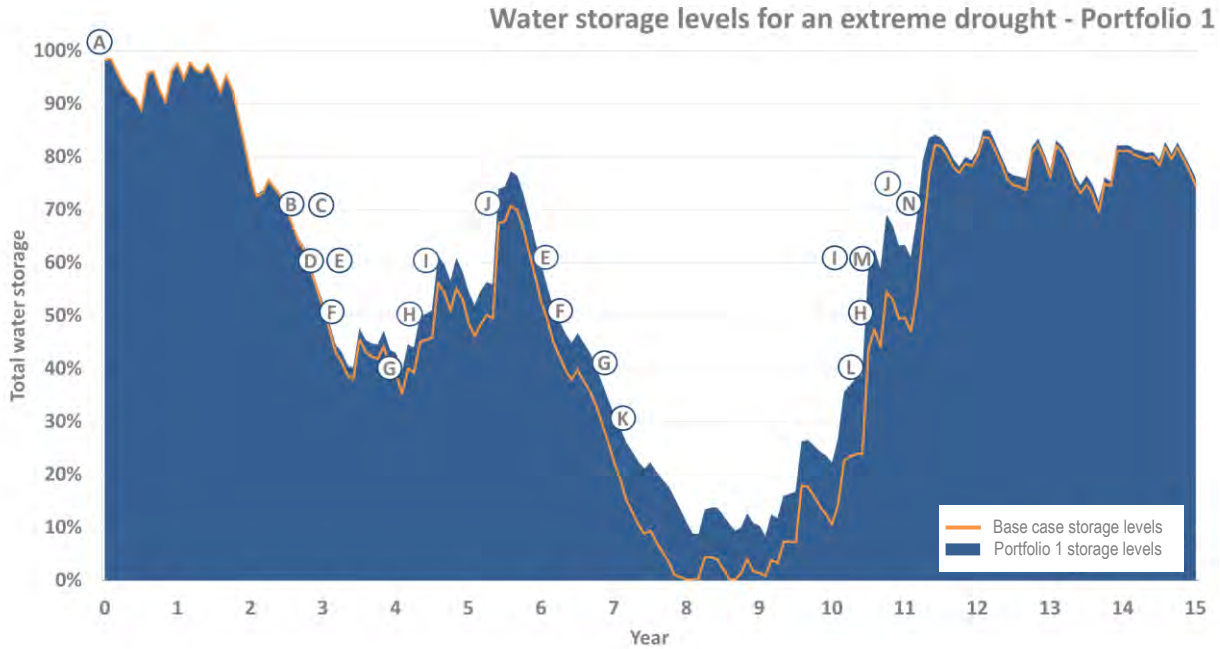
Portfolio 1 contains options that focus on making the most of the current sources of water by introducing common-sense rules to encourage all customers to use water wisely. This portfolio also reduces the demand for water by expanding on existing measures to further improve water efficiency and minimise losses from the water supply network during drought. It also introduces water restrictions during drought to reduce water use.

This portfolio includes:

- Water Wise Rules
- Drought restrictions
- Water loss minimisation - active leak detection
- Water loss minimisation - pressure management
- Water efficiency - non-residential
- Water efficiency - residential

Environment	Community	Drought security	Cost
Using water more efficiently has ongoing environmental benefits. No significant new infrastructure is required so there are no impacts from construction activity.	Feedback from community workshops showed strong support for water efficiency and demand management measures. These options ranked highly against the community values.	* This portfolio performs well in most climate conditions, but may not provide sufficient security in a very severe drought (in the simulation below, storage levels drop just below 10%).	$$$$ Lowest cost portfolio.

* *Drought security has been modelled over one million potential climate scenarios. The droplets give an indication of the relative chance of storages reaching near empty for all the droughts modelled (not just the extreme drought illustrated).*



- (A) Water Wise Rules start
- (B) Active leak detection & pressure management drought programs start
- (C) Non-residential water efficiency drought programs start
- (D) Residential water efficiency drought programs start
- (E) Level 1 water restrictions start
- (F) Level 2 water restrictions start
- (G) Level 3 water restrictions start
- (H) Level 3 water restrictions eased to level 2
- (I) Level 2 water restrictions eased to level 1
- (J) Level 1 water restrictions lifted
- (K) Level 4 water restrictions start
- (L) Level 4 water restrictions eased to level 3
- (M) Residential and non-residential water efficiency drought programs stop
- (N) Active leak detection & pressure management drought programs stop

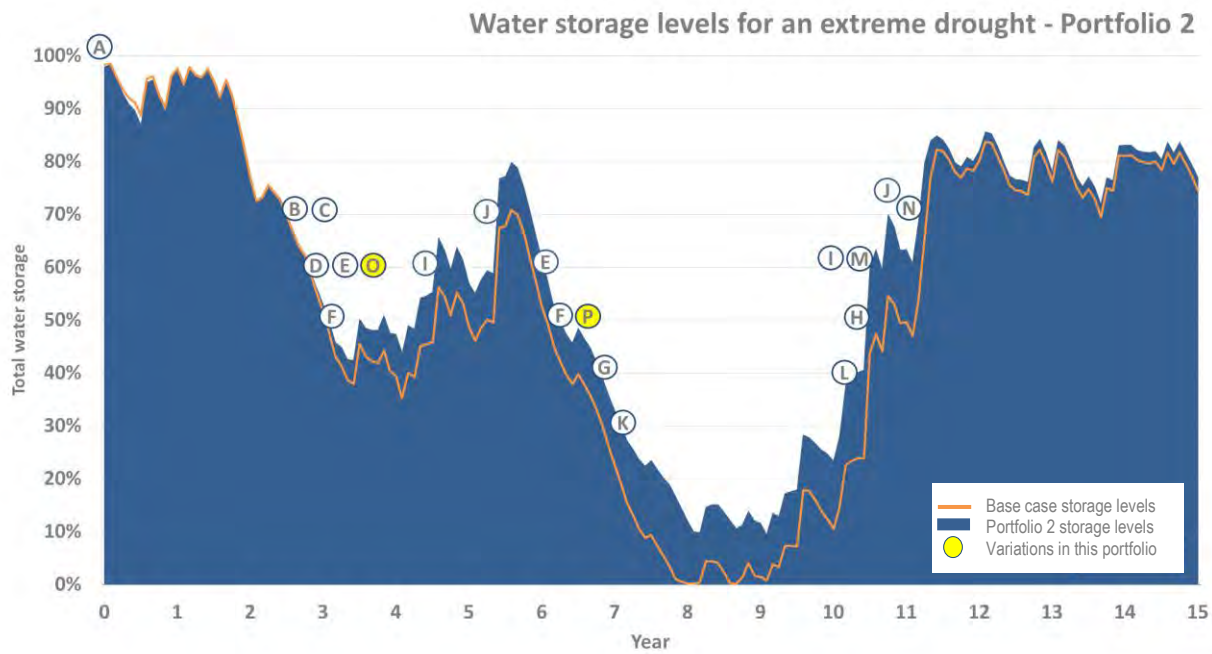
Understanding portfolio 2

Portfolio 2 includes the same focus on water efficiency and demand management measures as Portfolio 1, and also includes transferring water between the Central Coast and the lower Hunter. The existing water transfer agreement was developed in the 2000s drought to provide water to the Central Coast when their storages were low. This portfolio includes increasing the network capacity to transfer more water.

This portfolio includes:

- Water Wise Rules
- Drought restrictions
- Water loss minimisation - active leak detection
- Water loss minimisation - pressure management
- Water efficiency - non-residential
- Water efficiency - residential
- Inter-regional transfers - Central Coast

Environment	Community	Drought security	Cost
Construction of new water pipelines and pumping facilities to increase the transfer capacity from the Central Coast to the lower Hunter can be managed to minimise the potential for environmental impacts.	Inter-regional water transfers were supported in the community workshops. Transfers can occur in both directions, potentially benefitting the lower Hunter and Central Coast communities at different times.	Improved drought security.	Moderate cost.



- (A) Water Wise Rules start
- (B) Active leak detection & pressure management drought programs start
- (C) Non-residential water efficiency drought programs start
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- (J) Level 1 water restrictions lifted
- (K) Level 4 water restrictions start
- (L) Level 4 water restrictions eased to level 3
- (M) Residential and non-residential water efficiency drought programs stop
- (N) Active leak detection & pressure management drought programs stop
- (O) Water transfers from the Central Coast start
- (P) Water transfers from the Central Coast stop (depending on storage levels in both regions)

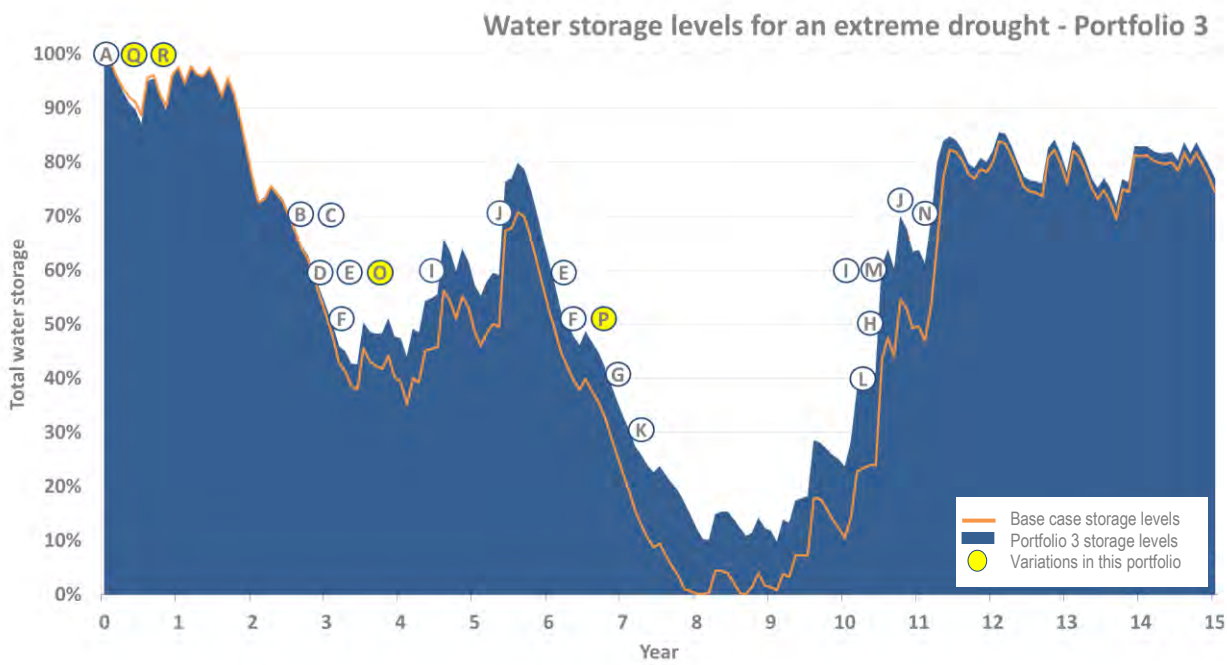
Understanding portfolio 3

Portfolio 3 includes the same measures of demand management and Central Coast transfers as portfolio 2, with the addition of options for harvesting stormwater to irrigate municipal playing fields and for other non-residential uses. It also includes rebates to encourage customers to install rainwater tanks to existing houses for non-drinking uses both indoors and outdoors. (Note: these rebates would not apply to new development, which must meet BASIX requirements for water efficiency).

This portfolio includes:

- Water Wise Rules
- Drought restrictions
- Water loss minimisation - active leak detection
- Water loss minimisation - pressure management
- Water efficiency - non-residential
- Water efficiency - residential
- Inter-regional transfers - Central Coast
- Stormwater capture - stormwater harvesting
- Stormwater capture - rainwater tanks

Environment	Community	Drought security	Cost
As for portfolio 2, plus construction of infrastructure to harvest stormwater for irrigation or other uses could have some localised environmental impacts.	Feedback from community workshops showed strong support for stormwater harvesting and rainwater tanks, while recognising that these have some limitations, especially during drought.	Drought security is only very slightly improved compared with portfolio 2.	$$$$ High cost.



- (A) Water Wise Rules start
- (B) Active leak detection & pressure management drought programs start
- (C) Non-residential water efficiency drought programs start
- (D) Residential water efficiency drought programs start
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- (J) Level 1 water restrictions lifted
- (K) Level 4 water restrictions start
- (L) Level 4 water restrictions eased to level 3
- (M) Residential and non-residential water efficiency drought programs stop
- (N) Active leak detection & pressure management drought programs stop
- (O) Water transfers from the Central Coast start
- (P) Water transfers from the Central Coast stop (depending on storage levels in both regions)
- (Q) Rainwater tank rebate program starts
- (R) Stormwater harvesting programs start

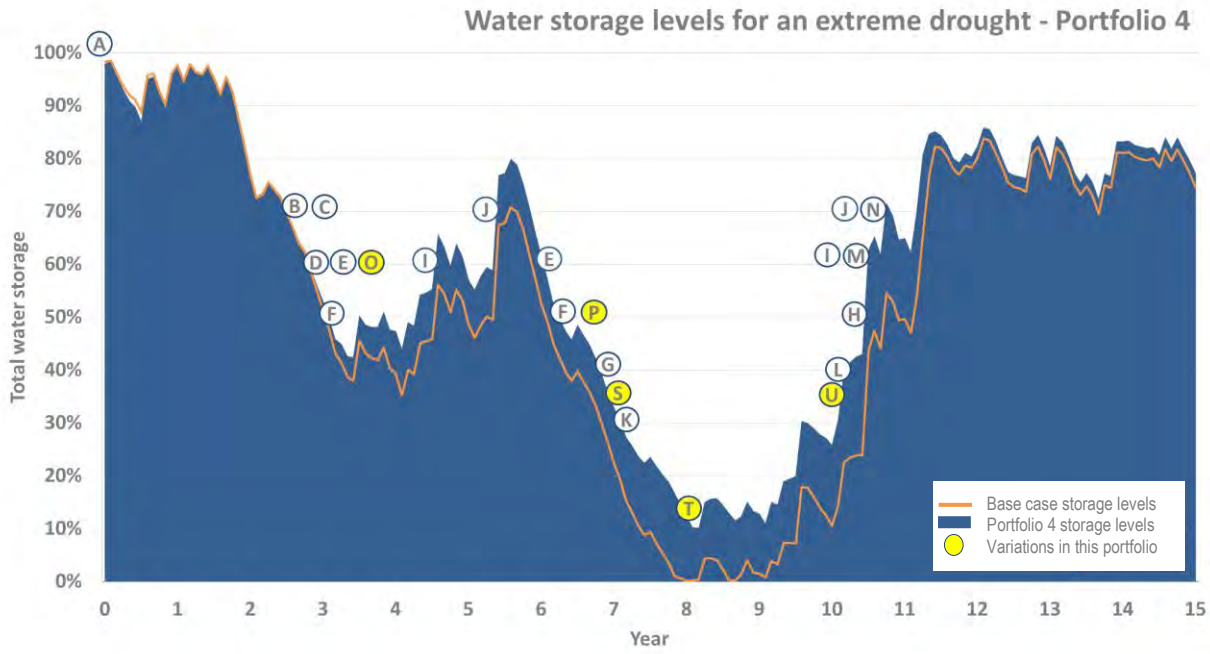
Understanding portfolio 4

Portfolio 4 includes the same measures of demand management and Central Coast transfers as portfolio 2, with the addition of a contingency measure to install temporary desalination units if needed during a very severe drought. These would only be installed if and when needed, deferring costs as long as possible. The units might be of shipping container size and they would be removed once they were no longer needed.

This portfolio includes:

- Water Wise Rules
- Drought restrictions
- Water loss minimisation - active leak detection
- Water loss minimisation - pressure management
- Water efficiency - non-residential
- Water efficiency - residential
- Inter-regional transfers - Central Coast
- Temporary desalination facilities

Environment	Community	Drought security	Cost
As for portfolio 2, plus installing and operating temporary desalination units could have short-term environmental and amenity impacts.	Feedback from community workshops indicated less support for temporary desalination than other options, but recognised this might be acceptable as an emergency option in a very severe drought.	This portfolio has the highest drought security of the six portfolios outlined here. Timing for temporary desalination can be flexible to increase security further.	Moderate - the cost is only slightly more than portfolio 2 because the portable desalination units are only triggered in a very severe drought, so the probability of incurring this additional cost is low.



- (A) Water Wise Rules start
- (B) Active leak detection & pressure management drought programs start
- (C) Non-residential water efficiency drought programs start
- (D) Residential water efficiency drought programs start
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- (J) Level 1 water restrictions lifted
- (K) Level 4 water restrictions start
- (L) Level 4 water restrictions eased to level 3
- (M) Residential and non-residential water efficiency drought programs stop
- (N) Active leak detection & pressure management drought programs stop
- (O) Water transfers from the Central Coast start
- (P) Water transfers from the Central Coast stop (depending on storage levels in both regions)
- (S) Construction of temporary desalination facilities starts
- (T) Temporary desalination facilities turn on
- (U) Temporary desalination facilities turn off

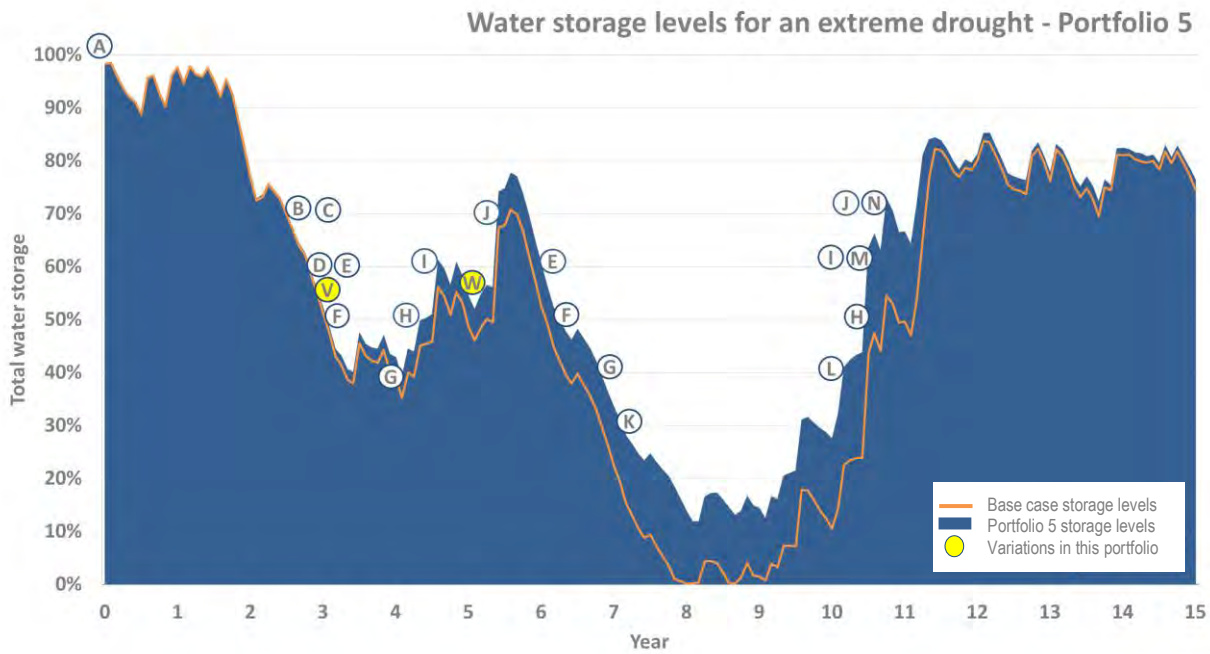
Understanding portfolio 5

Portfolio 5 includes the same measures of demand management as portfolio 2, plus the purchase of water from Lostock Dam. The dam is located on the Paterson River and is managed by State Water. Purchasing water licences on the open market would provide an additional source of water. A new water treatment plant (10 ML/day capacity) would be needed to treat the water to drinking standard, along with a pipeline to transport the water to connect with the water supply network.

This portfolio includes:

- Water Wise Rules
- Drought restrictions
- Water loss minimisation - active leak detection
- Water loss minimisation - pressure management
- Water efficiency – non-residential
- Water efficiency – residential
- Inter-regional transfers - Lostock Dam (existing size)

Environment	Community	Drought security	Cost
Potential construction impacts from a river off-take, new water treatment plant and pipeline to transport the water to the water supply network.	Feedback from community workshops indicated support for water transfers from Lostock Dam, recognising the benefits of using an existing dam that has some spare capacity.	Purchasing 'sleeper licences' only achieves a small increase in drought security. Lostock Dam may be in drought at the same time.	$$$$ Moderate cost.



- (A) Water Wise Rules start
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- (I) Level 2 water restrictions eased to level 1
- (J) Level 1 water restrictions lifted
- (K) Level 4 water restrictions start
- (L) Level 4 water restrictions eased to level 3
- (M) Residential and non-residential water efficiency drought programs stop
- (N) Active leak detection & pressure management drought programs stop
- (V) Construction of treatment plant and transfer infrastructure for Lostock Dam starts
- (W) Water supply from Lostock Dam starts

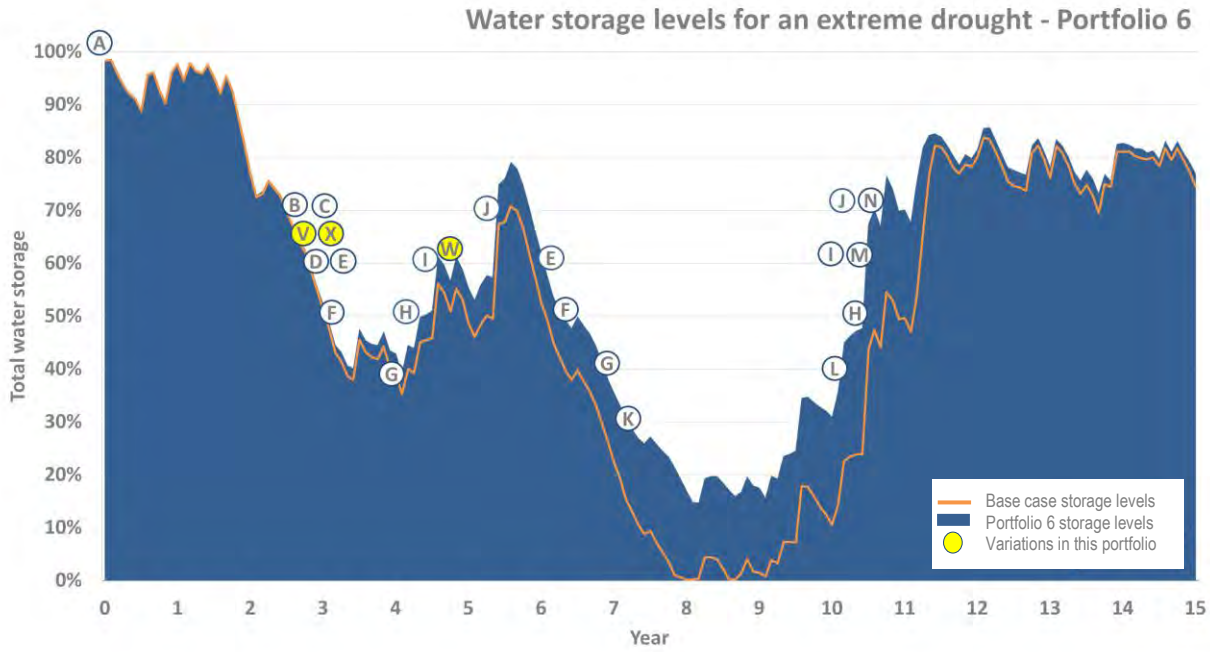
Understanding portfolio 6

Portfolio 6 includes the same measures of demand management as portfolio 2, and like portfolio 5, includes purchasing water licences from Lostock Dam. In addition, this portfolio includes the option of enlarging the dam from 20 to 33 GL storage capacity to facilitate access to a larger volume of water and hence provide more security for a drought. A larger new water treatment plant (20 ML/day) would be needed to treat the water to drinking standard, along with a pipeline to transport the water to the water supply network.

This portfolio includes:

- Water Wise Rules
- Drought restrictions
- Water loss minimisation - active leak detection
- Water loss minimisation - pressure management
- Water efficiency – non-residential
- Water efficiency – residential
- Inter-regional transfers - Lostock Dam (enlarged dam size)

Environment	Community	Drought security	Cost
As for Portfolio 5, plus potential impacts from enlarging Lostock Dam by raising the storage level approximately 5 metres – a detailed environmental assessment would be needed.	Feedback from community workshops indicated that enlarging an existing dam would be preferable to building a new dam, but other options were preferred.	Enlarging the dam improves drought security by increasing the amount of water that can be stored.	$$$$ High cost.



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- (J) Level 1 water restrictions lifted
- (K) Level 4 water restrictions start
- (L) Level 4 water restrictions eased to level 3
- (M) Residential and non-residential water efficiency drought programs stop
- (N) Active leak detection & pressure management drought programs stop
- (V) Construction of treatment plant and transfer infrastructure for Lostock Dam starts
- (W) Water supply from Lostock Dam starts
- (X) Construction to enlarge Lostock Dam starts

Giving your feedback

This discussion paper builds on the feedback so far from government agencies and from stakeholder and community engagement. The next series of community and stakeholder workshops provide an opportunity to comment on the portfolios outlined in this paper.

In providing your feedback, you may wish to consider and comment on the differences and trade-offs in environmental, security and cost features among the different portfolios described in the preceding pages.

This feedback will help to identify the mix of measures that are most appropriate to include in the *Lower Hunter Water Plan.*

Workshops

Wednesday 4 September 2013	Representative Community Group Newcastle
Thursday 5 September 2013 (evening)	Open community/stakeholder workshop Raymond Terrace
Friday 6 September 2013 (afternoon)	Open community/stakeholder workshop Charlestown

To RSVP for a workshop, you can call 1800 503 866 or go online www.haveyoursay.nsw.gov.au/lowerhunterwaterplan.

If you can't make it to a workshop, you can get involved through the online forum at www.haveyoursay.nsw.gov.au/lowerhunterwaterplan.

You can also send a submission by **20 September 2013** to:

E-mail: mwd@services.nsw.gov.au

Metropolitan Water Directorate
c/- NSW Public Works
PO Box 2297
Dangar NSW 2309

The most useful part of this workshop for me was the feeling of engagement in a thorough and transparent process.

community comment,
consultation workshop 2013

NSW GOVERNMENT

Metropolitan Water Directorate

A unit of the **Department of Finance and Services**

Engaging the community in developing the *Lower Hunter Water Plan*

Participants in a community workshop rank water planning portfolios

The *Lower Hunter Water Plan* sets out how we will ensure there is enough water to supply the people and businesses of the lower Hunter region, as well as how we will respond to severe droughts. It recognises the water needs for the lower Hunter's future growth and prosperity, as well as the needs of the environment.

The Metropolitan Water Directorate led a collaborative approach to developing the plan, by working closely with the community and other stakeholders to ensure their values, priorities, and preferences were incorporated into decision-making.

Community engagement for the *Lower Hunter Water Plan* had three key objectives:

- to raise stakeholder and community awareness about the need for a plan to secure the lower Hunter's water supply for future growth and potential droughts
- to ensure that social aspects, including values, were appropriately considered as part of the water planning process
- to facilitate understanding and acceptance of the plan.

Four sets of community and stakeholder workshops were held between December 2012 and September 2013, with a total of 15 workshops held in different locations across the region. The workshops were complemented by online processes, including information, surveys, and forums on the 'Have Your Say' website. The workshops discussed community values about water planning and a wide range of supply and demand options being considered for the region. They also explored the cost, drought security and environmental trade-offs among potential portfolios (or mixes of measures) for the *Lower Hunter Water Plan*.

Inviting community input

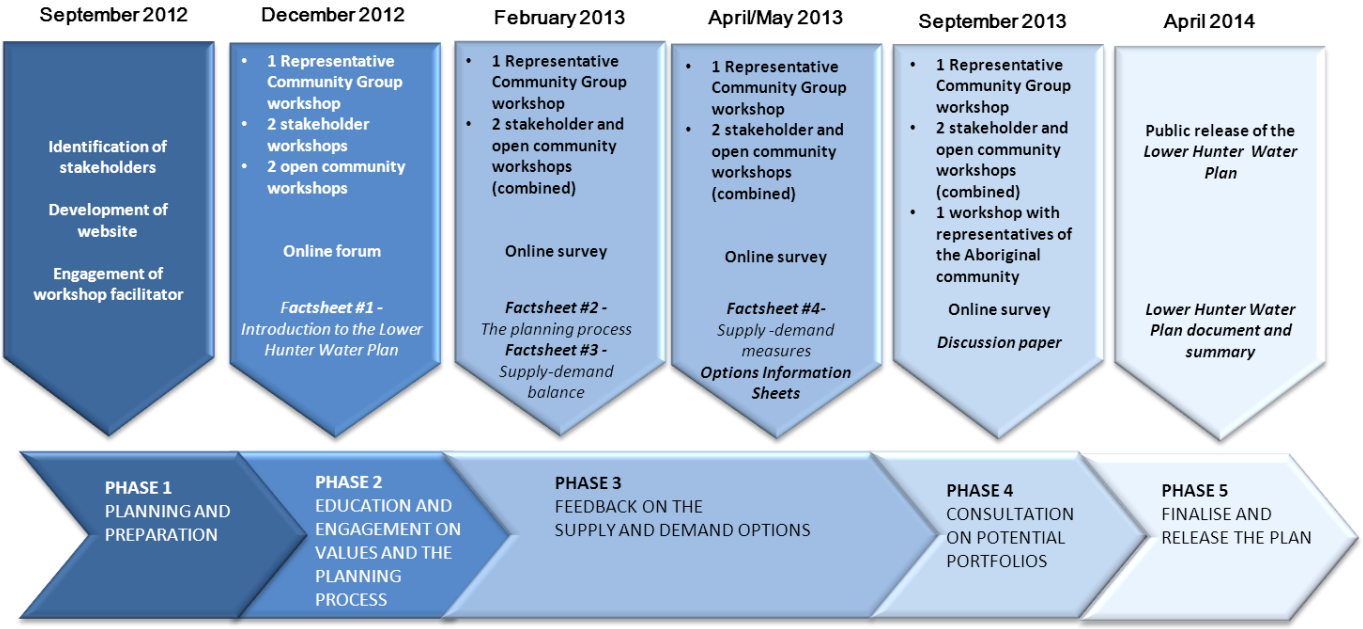
Workshops for the *Lower Hunter Water Plan* were designed to involve a broad spectrum of the community. This included stakeholders from identified groups, self-selected community members, and a Representative Community Group of randomly selected community members.

The Representative Community Group was recruited by the Hunter Valley Research Foundation as a sample of the diverse lower Hunter community, with a mix in gender, age and geographic area. This group was involved in developing the plan from beginning to end.

Stakeholder representatives from business and industry, agriculture, environmental groups, local government and educational facilities were invited to the workshops and provided valuable and diverse input.

Newspaper advertisements invited interested members of the community to have their say in the planning process either in workshops or online. Many community members took this opportunity, with a significant number joining in workshops in all phases of the process.

Some of the members of the Representative Community Group



What we heard from the community

The first round of consultation focused on community and stakeholder values about water planning. Workshop participants were asked to identify what mattered to them most about water planning. The responses were grouped together based on common themes, with participants identifying those they considered the most important.

The themes were combined from all the workshops and presented back at the next set of workshops so participants could review and confirm or modify community values. A similar approach was followed at a workshop with Aboriginal community representatives.

The final set of community values was:

- a process we can trust
- sustainable solutions and water conservation
- a fair and affordable system
- safe, healthy water for all uses
- protecting the natural environment
- a secure, reliable supply for all
- a strategic, balanced and adaptable plan
- investing dollars wisely
- respecting the Aboriginal cultural value of 'life water'.

In the second round of consultation, participants learned more about the latest demand forecast, the water needs of the Hunter, and seven broad categories of options:

- water efficiency
- demand management
- stormwater capture
- recycled water
- surface water
- groundwater
- desalination.

This workshop was an opportunity for participants to develop an understanding of regional water needs and the range of options that can save or supply water, and to provide broad feedback on each category.

By the third round of consultation, a list of around 20 specific options had been developed. These options were presented in detail so workshop participants could discuss how well each option reflected the community values. The workshops also explored the concept of portfolios by working in groups to identify and prioritise the options that were most consistent with the community values. The options selected most often included non-residential water efficiency, stormwater harvesting, inter-regional transfers with the Central Coast, drought restrictions, industrial use of recycled water and Water Wise Rules.

"The most useful part of this workshop for me was the feeling of engagement in a thorough and transparent planning process."

Community comment,
consultation workshop 2013

Workshop participants identifying their values, analysing and ranking supply and demand options, and discussing portfolios

How the community input was used in decision-making

Importantly, the activities at each set of workshops were designed to integrate with the planning framework, by providing data to incorporate in the decision-making process. This included both quantitative data (eg, a number) and qualitative information (eg, feelings and reasons).

The Metropolitan Water Directorate engaged the Institute for Sustainable Futures to develop and implement a 'multi-criteria decision analysis framework' to assess the options against criteria relating to cost, social, environmental and risk factors. This analysis brought together expert and community input to rank options and help develop portfolios for the next stage of modelling and evaluation.

The multi-criteria decision analysis combined community and expert input to help assess the options by comparing:

- the cost to improve drought security
- how well the option reflected community values
- certainty in implementing the option
- the potential to impact on the natural environment
- the flexibility to respond to drought in stages, without locking out other options in the future

Quantitative data on consistency with community values was collected directly from the workshops on options, where participants identified the options that best reflected the community values. The total number of times an option was selected was input to the multi-criteria analysis as a measure of 'consistency with community values'.

The outcomes of the multi-criteria analysis then guided the development of portfolios, which were outlined in a discussion paper released in August 2013 as background material for the final set of workshops. This paper outlined how the plan was being developed and presented six potential portfolios to the community for feedback. The discussion paper was sent out to stakeholders, the Representative Community Group, and participants from all other previous workshops. The community was invited to provide feedback on the portfolios in the discussion paper by attending a workshop and/or making a written submission. Eight written submissions were received from a mix of stakeholder and community representatives, and this feedback was another important input to developing the plan.

Again, community feedback from the final set of workshops was fed directly into the process to evaluate portfolios.The six portfolios were presented in detail, outlining the measures included in the portfolio and demonstrating the results of modelling how the measures would perform in droughts. After discussing the strengths and weaknesses of each portfolio, participants ranked the portfolios from most to least preferred. In selecting their preferred portfolio, participants at the workshops considered trade-offs among the cost, drought security and environmental features of the portfolios, and recorded the reasons for their preferences.

Participants at all workshops expressed strong support for the demand management and water efficiency measures included in every portfolio. A majority preferred portfolios that provided a greater level of drought security in a very severe drought through additional measures such as inter-regional transfers and temporary desalination.

Community feedback from these workshops provided quantitative data (the rankings) and qualitative information (the reasons) to input to the portfolio evaluation. The community and stakeholder rankings and reasons were combined with expert input to develop a recommendation to the NSW Government on the final portfolio presented in the *Lower Hunter Water Plan*.

The diagram below illustrates what the community was asked at each set of workshops, what the community said, and how this feedback was used.

	What we asked	What the community said	How we used the feedback
December 2012	What are your values about water planning?	• a process we can trust • sustainable solutions and water conservation • a fair and affordable system • safe, healthy water for all uses • protecting the natural environment • a secure reliable supply for all • a strategic, balanced and adaptable plan • investing dollars wisely • respecting the Aboriginal cultural value of 'life water' *(from the September 2013 workshop with Aboriginal community representatives)*	The values formed a reference point for developing the plan, and fed directly into the assessment of options in the April/May series of workshops.
February 2013	What do you think about information presented on the latest demand forecast and the broad categories of supply and demand measures?	This set of workshops was mainly about sharing information on the revised supply/demand balance, and to better understand the broad categories of options to prepare for the next round of workshops that would focus on specific options.	
April/May 2013	How well do the options under consideration for the *Lower Hunter Water Plan* meet the community values?	The options identified as being most consistent with the community values included non-residential water efficiency, stormwater harvesting, inter-regional transfers with the Central Coast, drought restrictions, industrial use of recycled water and Water Wise Rules.	Quantitative data from these workshops, along with technical information and expert input, was put into the multi-criteria analysis to help the planning team rank the options and build portfolios.
September 2013	How do the six short-listed portfolios compare and what do you think about the trade-offs among cost, environmental, and drought security features? Which portfolios do you prefer?	Workshop participants strongly supported the demand management and water efficiency measures included in every portfolio, and favoured the portfolios that provided a greater level of drought security by including inter-regional transfers and temporary desalination.	The feedback on community preferences and the reasons driving these preferences were input to the evaluation that led to a recommendation on the final portfolio for the *Lower Hunter Water Plan.*

Engaging the Aboriginal Community

A dedicated workshop was held in September 2013 for representatives of the region's Aboriginal community. The workshop was held at the Awabakal Newcastle Aboriginal Cooperative in Wickham, and was attended by representatives from across the region. The workshop covered values around water as well as information about the six potential portfolios. Participants highlighted lifestyle, sustainability, hygiene, employment, and water efficiency as priorities and identified *the Aboriginal cultural value of 'life water'* as a key value to include in the list of community values.

After discussing the supply and demand options and the six potential portfolios, workshop participants strongly supported the demand management and water efficiency measures included in every portfolio. This workshop also favoured portfolios that provided a greater level of drought security by including inter-regional transfers and temporary desalination for severe drought events.

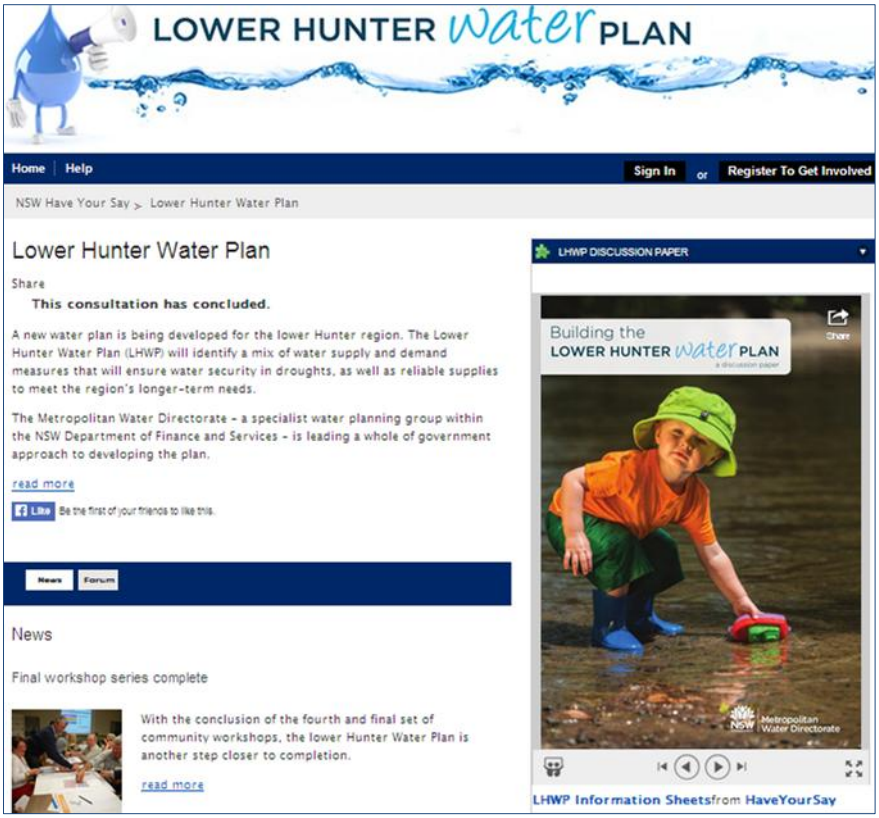
Online engagement

The Metropolitan Water Directorate used the government's 'Have Your Say' website throughout the planning process to invite community feedback on values, water supply and demand options, and portfolios.

In parallel with the workshops, the website was used to host forums and surveys which allowed an alternative way for community members to be involved and make a contribution.

'Have Your Say' also provided a way to give the community feedback on the results of engagement activities and progress on planning through regular news items, and a way to gauge community views on emerging issues and validate feedback from other engagement activities.

The site had over 7900 page visits during a 12-month consultation period, with many visitors downloading fact sheets, news items, and the discussion paper.



Choice modelling

Choice modelling is an economic survey technique that measures community preferences and estimates the value people put on social and environmental costs and benefits. The Metropolitan Water Directorate has used choice modelling as an input to the economic analysis in water planning for both the lower Hunter and greater Sydney.

The lower Hunter survey, involving over 400 community members, looked at the value people attach to water availability during droughts. The results were incorporated into the economic analysis. The choice modelling survey also explored community attitudes, and found that most people supported the idea of Water Wise Rules and agreed that water restrictions are fair and a good idea to have in drought.

'Thank you' to all our participants

The Metropolitan Water Directorate appreciates that integrating community engagement with the technical investigation and evaluation processes was critical to success in developing the *Lower Hunter Water Plan*.

To support an open and transparent planning process, participants were advised at each workshop how their input would be used, and the consolidated feedback from each set of workshops was reported back to the next set of workshops. This process helped to validate the feedback and, where necessary, modify how it was recorded to ensure it was a true reflection of the community input (for example, the list of community values was reviewed and modified at subsequent workshops). This process also demonstrated that participants at different workshops expressed a range of views and that all these views were important and being heard.

We would like to thank all the community members and stakeholder representatives who participated in the workshops or took the time to provide input online or in a written submission on the discussion paper. The feedback was valuable in ensuring the final plan is a balanced document that takes into account community values along with the technical inputs from hydrological modelling, economic analysis, environmental assessment, and the multi-criteria decision analysis framework.

Visit metrowater.nsw.gov.au/planning-lower-hunter to read more about the *Lower Hunter Water Plan*