Australian Water Recycling
Centre of Excellence

Project Report

Australian Water Futures:
Rethinking Community Engagement

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

University of New South Wales, November 2014

Australian Water Futures: Rethinking 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: 978-1-922202-25-3

Citation

Kearnes, M., Motion, J., and Beckett, J. (2014). *Australian Water Futures: Rethinking Community Engagement*. Report of the National Demonstration, Education & Engagement Program, Australian Water Recycling Centre of Excellence & the University of New South Wales.

© Australian Water Recycling Centre of Excellence

This work is copyright. Apart from any use permitted under the Copyright Act 1968, no part of it may be reproduced by any purpose without the written permission from the publisher. Requests and inquiries concerning reproduction right should be directed to the publisher.

Date of publication: November 2014

Publisher
Australian Water Recycling Centre of Excellence
Level 5, 200 Creek Street, 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.

Disclaimer

Use of information contained in this report is at the user's risk. While every effort has been made to ensure the accuracy of that information, the Australian Water Recycling Centre of Excellence does not make any claim, express or implied, regarding it.

AUSTRALIAN WATER FUTURES:

Rethinking Community Engagement

Dr. Matthew Kearnes, Prof. Judy Motion & Dr. Jennifer Beckett

November 2014

UNSW AUSTRALIA | Arts & Social Sciences

Australian Water Recycling Centre of Excellence

Purpose of the Document

This document presents the results of Stream 2.2 of the *National Demonstration, Education & Engagement Program* (NDEEP), a three-year study of public understandings and responses to drinking water produced from recycling schemes.

This document synthesises qualitative research and outlines a series of implications for community engagement practice and the design of media strategies.

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. It provides a communication portal for community, government, media and industry groups to access high quality, evidence-based information.

The project has also developed tools, methods and materials which provide consistent and relevant information across Australia, that aid in increasing community understanding and acceptance of water reuse as an alternative drinking water supply.

Citation

Kearnes, M., Motion, J., and Beckett, J. (2014). *Australian Water Futures: Rethinking Community Engagement*. Report of the National Demonstration, Education & Engagement Program, Australian Water Recycling Centre of Excellence & the University of New South Wales. November 2014.

The Authors

Dr. Matthew Kearnes is an Australian Research Council Future Fellow and convener of Environmental Humanities at the School of Humanities and Languages, University of New South Wales. Before arriving at UNSW he held post-doctoral positions at the Department of Geography at the Open University and the Centre for the Study of Environmental Change/Department of Sociology at Lancaster University. Most recently he held a Research Councils UK Fellowship at the Institute of Hazard, Risk and Resilience/Department of Geography, Durham University.

Matthew's research is situated between the fields of Science and Technology Studies (STS), environmental sociology and contemporary social theory. His current work is focused on the social and political dimensions of technological and environmental change, and he has published widely on the ways in which the development of novel and emerging technologies is entangled with profound social, ethical and normative questions. Matthew is a co-editor of the international open-access journal, *Environmental Humanities* http://environmentalhumanities.org/.

Contact: m.kearnes@unsw.edu.au

Dr Judy Motion is Professor of Communication in Environmental Humanities at the School of Humanities and Languages, University of New South Wales, Australia. Before arriving at UNSW she held professorial positions in the Faculty of Commerce, Wollongong University, Australia and the Waikato Management School, University of Waikato, New Zealand. She has also held an academic post in the Marketing Department at the University of Auckland Business School, New Zealand.

Professor Motion's research concentrates on environmental dimensions of public discourse, controversy and change. Her current research applies environmental humanities and communication perspectives to problems situated within the governance of science-society relations, activism and public engagement issues, and popular culture contexts.

Research grants include leadership of a five-year, New Zealand government funded, research project titled 'Socially and Culturally Sustainable Biotechnology' and membership, as an international researcher, of a three-year, New Zealand Government funded research project titled 'Building Our Productivity: Understanding Sustainable Collective Productivity'.

Professor Motion is currently completing a book on social media titled *Social Media and Public Relations: Fake Friends and Powerful Publics* commissioned by Routledge. She has published in numerous journals, including *Public Understanding of Science, Political Communication, Science and Public Policy, Media, Culture & Society, Organization Studies, Journal of Business Research, European Journal of Marketing, Public Relations Review* and the *Journal of Public Relations Research*. She has contributed chapters to the *Handbook of Public Relations, the Global Handbook of Public Relations, the Handbook of Communication and Corporate Reputation* and the *Encyclopedia of Public Relations*.

Contact: j.motion@unsw.edu.au

Dr. Jennifer Beckett is currently a lecturer in media communications in the School of Culture and Communication at the University of Melbourne. Her research interests include screen culture, online media, fan culture and the convergence of media platforms. She has previously worked as an online and social media producer at the Australian Broadcasting Corporation.

Contact: Jennifer.beckett@unimelb.edu.au

Table of Contents

Executive Summary

This report presents the results of Stream 2.2 of the *National Demonstration, Education & Engagement Program* (NDEEP), a three-year study of public understandings of and responses to drinking water produced from recycling schemes. This document synthesises qualitative research and outlines a series of implications for community engagement practice and the design of media strategies.

In the first section we explore the ways in which potable reuse is framed in contemporary policy, media coverage and social science literature. We argue that:

1. Three principle frames are evident in policy discussions and media reporting of water recycling – 'scarcity', 'water politics' and 'learning from controversy'.
2. In recent years major water infrastructure projects have been presented in the media as 'white elephants', with concerns about unnecessary expenditure, costs to the general public and notions of fairness and equity dominating media reporting.
3. In policy and social science literatures there has been a conscious effort to learn lessons from the controversies that surrounded the proposed implementation of potable reuse schemes in Queensland and the ACT.
4. These analyses have emphasised the importance of generating 'public acceptance' of water recycling and advocated that public participation and community engagement form a core component of the development of potable reuse schemes.
5. This commitment to public and community engagement sits uneasily alongside an emergent framing that presents potable reuse as 'inevitable' and further, that members of the public will simply need to 'get over' concerns about drinking treated wastewater.

The second section of the report focuses on what we describe as 'public water idioms', which capture something of the cultural contexts that influence public responses to potable reuse. We argue that understanding these 'starting points' provides an insight into the interpretive challenge posed by water recycling, and potable reuse specifically. In this section we argue that:

1. People's relationship with water is shaped by a range of cultural and symbolic meanings.
2. Water is strongly associated with a series of shared values, particularly those of fairness and community. Water is understood to be a shared resource that needs to be allocated equitably.
3. For members of the public the perceived absence of these values from contemporary planning processes serves to call into question the implied interests that underpin institutional practices and priorities.
4. These concerns influence how people respond to institutional communication practices, leading participants to question the veracity of messages around water scarcity.
5. Our focus group research suggests that, for members of the public, messages concerning water scarcity are interpreted as a tactic designed to provide legitimacy for new infrastructure developments.
6. In place of public consultation processes that appear to prefigure possible technological responses, participants expressed a desire for greater levels of consultation, citizen participation and empowerment in water planning processes.

In the final section we outline the results of a thematic analysis of our focus group discussions. In particular, we explore the disjuncture between the ways in which potable reuse is framed politically and institutionally and the ways members of the general public think about and make sense of recycled water. We argue that:

1. People's understandings of and responses to water recycling are dynamic. People are rarely *either* acceptors or non-acceptors.
2. Public responses to water recycling are shaped by a disjuncture between commonplace understandings of water, and its associations with notions of fairness, equity and common-ness, and the ways in potable reuse is presented as a largely technocratic response to water scarcity.

3. Public responses to potable reuse are therefore often highly conditional, and are influenced by a range of social, political and institutional factors, including: questions concerning the need for water recycling for drinking, trust in government and public institutions, notions of choice and consumer preference and concepts of control and empowerment.
4. While members of the public recognise the need for broad public consultation regarding water recycling, there is likely to remain a significant differential between the ways potable reuse is framed in policy and media and the issues that publics consider salient in decision-making.
5. For these reasons, the introduction of potable reuse schemes without adequate community engagement and consultation is likely to intensify existing concerns about the trustworthiness of government and perceptions of political mismanagement.

We close the report by exploring the implications of our research for community engagement and communication practice. We outline five key challenges:

1. Moving beyond 'public acceptance';
2. Moving beyond 'technological choice';
3. Creating avenues for on-going community engagement;
4. Creating a holistic approach to engagement and communication;
5. Engaging the opportunities of social media.

Chapter 1: Introduction

Land of the Rainbow Gold,
For flood and fire and famine,
She pays us back threefold

Dorothea Mackellar, 1908, *My Country*

Setting the Scene

Water flows, literally and metaphorically, through our culture; in what is commonly regarded as the driest continent on earth, water occupies a unique place in the popular imaginary. The Australian vernacular is redolent with images of water, both of its absence and, at times, its terrifying presence as 'droughts and flooding rains'. Water also figures prominently in everyday parlance and popular culture – from daily weather forecasts to popular sporting and leisure pursuits and the routines of domestic care and instruction.

"The most constant 'quality' of water" the anthropologist Veronica Strang (2004) suggests "is that it is not constant, but characterised by transmutability and sensitivity to changes in the environment" (p. 49). Water is bound up with the changing patterns of social life, which are embedded in cultural memory and, in turn, shape contemporary attitudes to, and expectations of, existing water supplies. Many people are able to recount the changing social relationships with water. Within living memory the family bath and household toilet have moved from outside to inside the house – from the outdoor 'dunny' and copper bath, usually located somewhere in the backyard, to the increasingly aestheticised image of modern colour-coded and temperature controlled bathrooms (Davison 2008). At the same time, practices of communal bathing – where a family might bathe together once a week – have largely been replaced by those of private washing and personal hygiene.

The domestic use of water is also intimately entangled with the changing social geographies of the home. Where the use of water in domestic spaces has traditionally been shaped by the relations between the genders, the once arduous task of 'doing the laundry' has become increasingly automated and technologised (Watson 2014). Water in the home, and in cities more generally, is now more readily available and often taken for granted and rendered invisible (Kaika 2005). The movement of water is also hidden in other ways, embodied in agricultural production, packaged food and consumer products (Allan 2002).

The often-invisible infrastructures of water – the supply of reliable and safe drinking water and the treatment and disposal of waste, and assumptions concerning the sustainability of existing water supplies – have also been crucial to the pattern of modern urbanisation, at least since the nineteenth century (Kaika 2005; Scott 1998). Practices of domestic water consumption have also changed with the shifting forms of Australian urban life (Everett*, et al.* 2004). As Australian society has taken on an increasingly suburban character – the result of an historic shift from once-crowded inner cities to new and increasingly master-planned garden suburbs – the traditional backyard has undergone an aesthetic makeover. As the once productive spaces of the vegetable patch and fruit tree have given way to landscaped gardens and outdoor entertaining areas, so too have everyday watering practices changed to accommodate these new spaces (Askewa and McGuirk 2004; Head and Muir 2007).

While our everyday relations with water are an index of changing social, religious and moral sensibilities, the management of water is also inextricably tied to the negotiation – and contestation – of relations of power, authority and expertise. Water is intensely and irrevocably political and the recent controversies concerning water management and allocation – across both the developed and developing world – are a vivid testament to this fact (Heynen*, et al.* 2006; Sultana and Loftus 2012; Swyngedouw 2004).

Given the centrality of water to everyday life – and the rich and embodied cultural associations that shape public understandings – it is striking that the contemporary management of water provision has tended to adopt a "pipes and pumps" (Beder 1989) approach in which "engineering is privileged over service to the community's needs and a closed technocratic culture stifles public involvement in deliberative processes" (Arvanitakis and Brown 2013, 95). Nowhere is this more apparent than in the development of Australian water management practices and institutions. In a summary of the overlapping phases of Australian water management, Dovers (2008) argues that, while the practices of the early European colonists were

characterised by “rapid development … and a mostly localised and ad hoc approach to capture, provision and disposal” (p. 88), the rise of new notions of public health in many Australian cities “defined the imperative for the development of reliable, widely (if not universally) accessible bulk supply and disposal of water and related wastes” (p. 88). One of the principal effects of the drive toward efficient bulk supply – that from the nineteenth century came (and continues) to define practices of water management – is the co-evolution of what Powell (2000) characterises as an ‘engineered ascendency’ with statutory authorities engaged in water regulation. All the while the underlying – and often unchallenged – assumption that shaped Australian urbanisation was the “comforting belief” that, as demands for water increased, there would always be “additional supplies available and all that was required was application of engineering skills to deliver them to the cities” (Troy 2008, 190).

The combined effects of these dynamics have been decision-making processes that have tended to focus on large-scale engineering responses to the problems of water supply – with a penchant for dam construction and long-range pumping only recently being supplanted by excursions into desalination and water recycling schemes. At the same time, this pattern of decision-making has contributed to relatively static and atomistic relationships between members of the public and what are perceived to be opaque institutional structures. The sociologist Zoë Sofoulis (2011) argues that, in contemporary water management, urban water users have historically been understood as “an undifferentiated population of dependent, ignorant and non-responsible citizen beneficiaries of one-size-fits-all services” (p. 796).

The growth of the Australian population, which has tended to be geographically concentrated in existing urban conurbations (McGuirk and Argent 2011), together with environmental change, and the variations in historic rainfall patterns, have thrown into sharp relief the inadequacy of the largely infrastructure-centric approaches that have dominated thinking on provision of drinking water in Australia. While contemporary debates over the sustainability of existing water supplies have done much to galvanise policy thinking, to date the proposed implementation of a range of alternative source water initiatives – principally potable reuse and desalination schemes – has occasioned significant expressions of public concern and political controversy (Hurlimann and Dolnicar 2010; Tal 2011). While many commentators have begun to question whether the Australian population is now ‘ready to accept’ the use of recycled water to augment existing drinking supplies; significant questions remain about the capacity for both policy makers and water companies to generate broad political and social consensus on implementation of alternative water source projects.

In the following chapters of this report we will explore the ways in which the development of recycled water schemes has been framed in contemporary media coverage and policy literatures. We will also outline the results of a three-year study that examined public responses to the development of potable reuse schemes.

The study is situated in an extraordinary period in the contemporary history of Australian water management practices. What came to be termed the ‘Millennium drought’ – a period of extremely low rainfall that stretched between 2000-2012 and was commonly regarded as the worst drought since European settlement[1] – has done much to generate public discussion of the future sustainability of Australian water supplies. Aside from recent investments in the development of new water sources, regulatory responses to the ‘Millennium drought’ were characterised by the deployment of water restrictions and demand management strategies, alongside long-range pumping at the height of the drought. While water restrictions have proved to be relatively effective – with household water consumptions rates of around 140 litres per person per day at the height of the drought, “a 60-year low since its peak at 400 litres following the Second World War” (Strengers 2011, 38. See also Davidson 2008) – their social effects have been relatively mixed and have done little to bring about fundamental changes in everyday water use (Randolph and Troy 2011; Strengers 2011). At the same time, the proposed development of desalination and potable reuse schemes has precipitated profound social anxiety and controversy. In a recent commentary Wallis (2012) suggests that the combined effects of these dynamics has been that “water planning [is] seen as politicised and opaque – justified as a response to a crisis drought situation”. Fam (2014) reports that, in response, communities have “become more savvy in demanding and voicing their desires for more sustainable systems of service provision for urban water” (p. 7). Exploring public responses to water recycling in a period of relative water plenty[2] therefore offers a glimpse into the changing social and cultural relations with water.

[1] Recent commentators have, however, noted that the WWII drought that lasted between 1937-1945 ‘was about as bad as the one we just had’ (Van Dijk 2013).

[2] This study was conducted between 2012-2014.

Research Design and Methods

Contemporary social problems raise complicated questions about collective societal sense-making processes that necessitate a set of inquiry methods designed to identify the meanings and valuing systems that underpin such problems. Qualitative inquiry, which concentrates on understanding social data associated with "experience, emotions, events, processes, narratives, poetics, the politics of possibility" (Denzin 2009, 143), rather than the more quantitative focus on prediction, inference and causation, offers a range of diverse methods for examining social problems. In this study an appropriate set of qualitative inquiry approaches was selected to examine the interpretive frames that members of the Australian public draw upon to make sense of recycled water initiatives, and the institutional contexts and frames that may influence such sense-making processes.

Two key phases were designed to structure the research program: the first phase involved data collection and content analyses and the second phase was primary data collection. In phase one, at the outset of the project, a literature review was conducted to offer an overview of current national and international research and generate insights into the key social issues associated with recycled water and potable reuse. This review included research on public responses to potable reuse in addition to current scholarship on community engagement, media and social media (see Motion*, et al.* 2012). A content analysis of salient policy and media coverage of recycled water and related issues was then undertaken. This was done to understand the discourses that frame Australians' understandings of recycled water and potable reuse and to identify the contexts and meaning creation processes that underpin such sense making processes. Findings from the media and policy analyses were then integrated with insights from the literature review to inform the primary data collection process. In the second phase, primary data was generated from focus groups, undertaken with a cross-section of Australian publics as part of the NDEEP research aim to develop community engagement guidelines.

Phase One: Content Analyses

In keeping with themes identified in previous studies, media coverage and policy documents were analysed for content. The analyses were guided by insights discovered by exploring media best practice:

> **1. Sentiment mapping** research was designed to identify the media framings of water recycling and water issues more generally, together with relevant trends in media reporting and practice. The data-mining software package OpinionWatch, provided by NICTA (National Information Communications Technology Australia) a research Centre of Excellence, enabled researchers to mine data from social media sources (blogs, twitter, YouTube and online commentary) as well as the outputs of traditional media sources. Qualitative search terms were used to map the media reporting of water recycling, and broader water planning and management issues. This software was also used to build sentiment maps for recycled water based on online commentary, social media and reader feedback; which allowed researchers to examine the ways in which media reporting seeds broader public consideration of recycled water.
>
> 2. **Policy documents** content analysis was undertaken to identify key governance frames that are applied to recycling and potable reuse. We reviewed reports issued by the Australian Academy of Technological Sciences and Engineering (Khan 2013); the National Water Commission (2010); the Prime Minister's Science Engineering and Innovation Council (2003); and the Productivity Commission (2011).
>
> 3. **Targeted interviews** with national and international media advisors and communication professionals (10) employed in the water sector helped to garner best practice and to trial the proposed guidelines with professionals working in the field.

The OpinionWatch research focused on the years 2000-2014, and analysed over 6,000 individual articles. These articles were sourced through Reuter's Factiva database using the search term "recycled water" and were limited to Australian newspapers (including regional newspapers). The researchers then 'cleaned' the list of articles to ensure that there were no repeated articles and provided downloaded copies of the articles to the NICTA research hub where they were transferred to a coded database and uploaded into the OpinionWatch software.

OpinionWatch uses a set of project-specific customised algorithms to conduct a computer-assisted analysis of opinion and sentiment. It allows users to define search parameters within the provided data in order to perform a variety of tasks, including relational analysis ('versus' analysis) on topics. Using specific search terms, researchers were able to create cluster maps focused on the frequency of key terms.

The software also captures information such as author names, date of publication and the provenance of articles; enabling users to identify key journalists and publications and the tone of the articles they write. From this information, a bar chart is created for each search, indicating the prevalence of the term (or topic) across the requested time frame and the overall sentiment. For the NDEEP project this has been invaluable in determining when and where the issue of recycled water has gained the most traction across Australian media.

Together with in-depth interviews conducted with communications practitioners, this research has shown that media coverage of potable reuse in Australia is episodic and tends to focus on specific events – such as isolated controversies, the publication of high-profile reports into recycled water, and political engagement with the issue around elections. In addition, this research suggests that there is no perceivable pro or anti-potable reuse skew in the data, rather media coverage is reactive and reflects the circumstances surrounding pre-existing discussions.

In addition we have also assessed the water sector's use of mobile and social media. There is a growing use of social media as an informational platform but fewer opportunities for interactivity are evident within those platforms – Sydney Water's TAP campaign is a highly successful exception to this rule.[3] Interviews with communications managers in water utilities have indicated that, while there is recognition of the need to engage with social media, the resources to use and monitor it effectively are currently not available. These findings from phase one are discussed in the following chapter.

Phase Two: Focus Group Research

The focus group methodology was designed not only to discuss water related issues, but also to trial a range of inventive techniques that may be applied for engagement. As Lury and Wakefield (2012) note, inventive methods are ways to "introduce answerability into a problem" (p. 2).

Ten focus groups were convened across Australia in a range of urban, peri-urban, suburban and rural locations. The mix of research sites was selected to include the range of geographic and demographic criteria that are likely to influence public responses to recycled water – including: existing water infrastructure and supply options, patterns of climate change and demographic pressures.

The locations for this focus group research were:

1. Perth – Suburbs
2. Adelaide Hills
3. Melbourne – two groups, inner-city and suburbs
4. Gold Coast/Tweed heads
5. Sydney – Eastern Suburbs
6. Mudgee (rural NSW) – two groups
7. Penrith
8. Rouse Hill.

Table 1 outlines the matrix of selection criteria used in each study site. A mix of demographic criteria and attitudinal variables determined the precise location for each focus group. Each group consisted of ten members of the public, independently recruited by a professional recruitment agency in order to achieve the broadest, most representative sample of Australian attitudes and concerns to the issue of potable reuse of water.

[3] See: www.tapsydney.com.au/

Table 1: Focus Group selection criteria

Group	Attitudinal Variables
Adelaide Hills	Middle to upper-class retirees. Involved in civic life, members of community or voluntary organisations.
Eastern Suburbs, Sydney	Participants considered themselves to be relatively health conscious. Engaged in physical exercise. Working in grey to upper-white professions.
Fitzroy	Young professionals working in grey to upper-white professions. Participants enjoyed cooking, eating at new restaurants and considered themselves to be socially and environmentally conscious.
Mudgee Environmentalists	Drawn from upper-white to grey professions. Participants considered themselves to be environmentally conscious. Regularly used organic, fair trade and free-range produce, complementary therapies or alternative medicines and practices.
Mudgee Farmers	Working in agriculture – either directly or indirectly. Participants lived in the area around Mudgee and on rural properties.
Penrith, Sydney	Recent immigrants from non-English speaking countries.
Perth	Parents with children, drawn from grey-white professions. Enthusiastic about science and technology. Early adopters of new technologies. Positive towards science, interested in it, and had confidence in its ability to better society.
Rouse Hill, Sydney	Parents with children 10 years and under. Primary care-givers or part-time workers. Participants lived in a house with a 'purple pipe' tap connected to their residence.
St Albans, Melbourne	Established residents in their neighbourhoods. Drawn from upper-blue to grey professions, or responsible for household duties and caring for children.
Surfers Paradise	Working in hospitality, tourism, retail and the service sector. Not members of a community group. Recently moved to the Gold Coast.

Participants were pre-screened, using key questions around salient attitudinal and sociological variables. These variables included: involvement in public and community life, green values, technological optimism and early adoption, notions of self-care and healthy lifestyles and interest in food and organic produce. To encourage a depth in the focus group discussions, each group was recruited to be relatively consistent demographically. However, a segmented range of values and demographic variables was covered across the ten groups.

The events were closed, by invitation only and not advertised publicly. Each group met twice, either on consecutive nights or across two weeks, to allow time for reflection and evaluation (the variation was determined by the availability of the participants and researchers). Researchers used appropriately designed stimulus material to simulate water scarcity and planning issues and illustrate the need for water source diversification and the benefits of water recycling. The discussions concentrated on qualitative processes of collective sense making – how members of the general public make sense of the need for water source diversification and how they prioritise water recycling against other potential responses. A range of innovative methods was used to elicit people's thinking around the future of water in Australia, specifically the use of recycled water for potable purposes. The first session included discussion of a range of stimulus material designed to open up in-depth discussion of potable reuse.

For the second session, researchers developed the methodology of **reflexive dialogue** to enable participants to reflect on their earlier conversation and expand points for further discussion in more detail. The sessions closed with a **visual research method** in which participants were asked to draw a representation of what they imagined the future of water supply in Australia might look like.

Focus Group Design

Session one:

1. Introduction
As a technique for establishing rapport and commonalities, each focus group started with a discussion of the location and issues related to technological change. The aim was to establish a set of commonalities that would inform discussion of water-related issues that were specific to each location.

2. Photo elicitation and keywords
After the introductions, participants were asked to select a water-related photograph that in some way resonated for them. The photographs included images of drinking water, the ocean, still rivers, and polluted water sources. These images were selected to encompass a variety of water experiences and provide a prompt for focus group discussion. Photo elicitation was adopted as a technique to stimulate discussion because it may be both indicative of, and initiate, sense making processes. According to Bell (2012) photos do not so much "reveal and represent", as provoke and invite responses. Bell (2012) suggested that diverse processes of creativity, ethics, politics, and subjectification – the ways in which we constitute our identities - may all be explored through this technique. In their descriptions of the water images, participants suggested words that described the role of water in their lives. This approach fits with the keyword analysis technique developed by Raymond Williams (1976) that provides insights into the cultural meanings and social differences at play and how they structure and inform systems of thought within collective sense making processes.

3. Educational stimulus material
A range of educational stimulus material that had been developed in consultation with NDEEP colleagues with specialist knowledge of the technical processes was then presented to the participants to introduce the topic of recycled water. The first session concluded with a request that participants undertake some independent research into an aspect of water reuse that interested them.

Session two:

1. Independent Research
Participants consulted a range of resources, including: online Google searches, media research, and 'vox pop' type surveys with family, friends and colleagues. The value of this approach is that it provides insights into information needs, priorities, interests, and "matters of concern" (Latour 2004).

2. Reflexive Dialogue
Participants' comments from the previous session were thematically analysed and shared with them in the second session. The aim was to stimulate in-depth discussion and overcome the tendency for focus group research to be wide-ranging rather than deeply reflective. The reflective dialogue technique we developed was based on recent theories of interaction, for example discourse and conversation analyses (Puchta and Potter 2004; Roulston 2010).

3. Dialectal Perspectives
Participants discussed how they made sense of contrasting expert perspectives on recycled water and potable reuse. This technique provided insights into the sources that participants considered trustworthy, their sense making processes and how they make decisions about prioritisation of a range of options (Weick*, et al.* 2005).

4. Visual Research Method
In this part of the focus groups we drew on recent developments in the use of visual methodologies in contemporary social science research. In this field it is recognised that the creation of visual representations offers a way of depicting implicit and tacit community values while also offering resources for deepening focus group discussion and reflection (Pink 2013; Rose 2012). In this study we deployed a thematic drawing technique (Young and Barrett 2001) in which participants were asked to visualise the future water supply for Australia and to draw a representation of that vision. The approach provided insights into the cultural associations and attachments participants had to particular forms of water supply.

After the focus groups had concluded the transcripts were thematically coded (Braun and Clark 2006; Owen 1984) using MAXQDA, a qualitative data analysis software program that simplifies the organisation, coding, and interpretation of the focus group and communication interview data.

Structure of the Report

In the following sections of this report we outline findings from our research and highlight five key challenges in building broad community consensus around alternative water source projects, and potable reuse initiatives in particular:

1. The first section offers an exploration of the ways in which potable reuse is framed in contemporary policy, media coverage and social science literature.

2. The second section of the report focuses on what we describe as 'public water idioms', which capture something of the cultural contexts that influence public responses to potable reuse. We argue that understanding these 'starting points' provides an insight into the interpretive challenge posed by water recycling generally, and potable reuse specifically.

3. In the final section we outline the results of a thematic analysis of our focus group discussions. In particular, we explore the disjuncture between the ways in which potable reuse is framed politically and institutionally and the interpretive strategies deployed by members of the general public.

Chapter 2: Framing Potable Reuse

In this chapter we explore the ways in which water recycling, and specifically potable reuse, have been framed in contemporary media reporting, policy literature and social science analyses.[4] We focus particularly on key themes across each of these areas, trends evident in media coverage and the trajectory of potable reuse as a 'public problem' (Borraz 2007; Gusfield 1981; Hilgartner and Bosk 1988).

Overall, our analysis suggests that media coverage of water recycling and potable reuse is generally positive to neutral – focused on issues around environmental sustainability, coverage of significant government decisions and investments and reports on the technical aspects of water treatment technologies. However, it is also evident that, while this more positive coverage outweighs negative reporting, the proposed development of water recycling initiatives remains both controversial and politically sensitive. It also appears that media coverage of water recycling is shaped by a set of common frames that present water issues in primarily political terms. Notions of the political mismanagement of water planning in general, and a 'water war' frame that presents major infrastructure planning processes in adversarial terms, exercises a significant influence on the coverage of potable reuse. In order to better understand this disjuncture between generic positive coverage of water recycling and the overtly politicised coverage of water planning processes, we focus on issues around agenda building, media narratives and the 'controversy framing' evident in coverage of issues around science and technology (Nelkin 1987; Stallings 1990; Weaver*, et al.* 2009).

In the first section of this chapter we identify three key frames: 'scarcity', 'water politics' and 'learning from controversy'. In the later sections of this chapter we analyse the framing of water recycling and highlight the narrowness of existing representations of potable reuse, which we suggest has been presented primarily as a technological response to water security issues, with limited scope for active public participation in decision making. While recent scholarly work on the media representation of potable reuse has focused on specific cases and controversies (Dolnicar and Schaefer 2009; Hurlimann and Dolnicar 2010; Price*, et al.* 2012) in this chapter we provide an overview of the policy and media contexts that are likely to shape public responses and political considerations of recycled water. An understanding of these issues will be critical to the design of strategic media and community engagement initiatives.

Scarcity

Historic narratives of water scarcity and environmental vulnerability – and the often-unacknowledged assumption that water sustainability is simply a matter of overcoming technical challenges to bulk supply – have indelibly shaped policy considerations of water recycling. In this light the public discussion and media coverage of the impacts of environmental and social change on water security issues have been relatively consistent with a 'pipes and pumps' approach – itself a legacy of the post-settlement development of Australian water infrastructure. The challenge of ensuring the long-term sustainability of water supplies in Australia is presented as a problem that requires large-scale technological solutions and infrastructure projects (Sofoulis 2005).[5]

While a number of state governments have imposed policy bans on the use of recycled water to augment drinking supplies, a national policy discourse has emerged that broadly suggests that supply augmentation will be necessary in light of environmental change and uneven population pressures. A review conducted by The Prime Minister's Science Engineering and Innovation Council (2003) outlined the challenge facing Australian urban drinking water supplies:

> "Our cities are continuing to grow and the increasing demand for water is causing concern. Many of our cities are now experiencing moderate water restrictions as a consequence of the current 7

[4] For an extensive survey of the existing social science literature on public responses to water recycling and alternative water sources more generally please see Motion, *et al.* (2012).
Sydney. Please also see: Alexander, *et al.* (2008); Green, *et al.* (2010); Po, *et al.* (2003).

[5] This is striking when seen in the context of the broad public uptake of water efficiency and rainwater harvesting techniques. For example, the Australian Bureau of Statistics reports that 'In March 2013, 34% of Australian households living in a dwelling suitable for a rainwater tank had a rainwater tank compared with 32% in 2010 and 24% in 2007. The increase from 2007 to 2013 may be attributed to water restrictions, government rebate schemes, water regulations and water' (Australian Bureau of Statistics 2013).

> year drought, one of the worst since European settlement. This drought has shown that many of our cities do not have enough water to keep going in the ways of the past. … There are also concerns that climate change will reduce the amount of rainfall on the catchments of Southern Australia. … The suggested changes indicate that we may have to cope with an even more uncertain climate than we currently experience. … In order to maintain the economic growth of our cities there are only two options. The first is to encourage people to use less water; the second is to find alternative sources of water." (p. 1)

With a limited capacity to construct new water storage facilities, water recycling is presented as one of a series of alternative supply technologies that *should* be considered. The Prime Minister's Science Engineering and Innovation Council (2003) report argues that water recycling will constitute 'one strategy for providing reliable water supplies' while its 'specific role will depend on its relative environmental sustainability and cost effectiveness for the particular city' (p. 5).

In a recent position statement the National Water Commission (2010) made a similar argument, suggesting that 'arbitrary policy bans on recycled water should be removed so that recycling options can be considered alongside alternatives on their relative merits' (p. 1). Recognising that there are 'intrinsic risks associated with recycled water' the Commission was unambiguous in its support for the 'expanded use of recycled water throughout Australia', subject to four conditions:

1. "Prior cost/benefit and risk analyses are conducted which take full account of social and environmental externalities and avoided costs";
2. "The best available science is utilised";
3. "The project is subject to best practice regulatory arrangements (based on the Australian Guidelines for Water Recycling)"; and
4. "The community participates in decisions to introduce recycling and that subsequent management arrangements are transparent and accountable." (p. 1)

This position was also supported by a recent Productivity Commission (2011) study into the Australian Water Sector, while a study published by the Australian Academy of Technological Sciences and Engineering concluded that, though "optimum solutions will continue to be case-specific" the Academy is "convinced of the technical feasibility and safety of drinking water supply through DPR when properly managed" (Khan 2013, 120). Accordingly the report argued that "Governments, community leaders, water utilities, scientists, engineers and other experts will need to take leadership roles to foster the implementation and acceptance of any DPR proposal in Australia" (p. 120).

Though potable reuse remains politically sensitive in many locations throughout Australia, what we see here is an emerging policy discourse that suggests that, in order to adapt to both environmental change and demographic concentration, water recycling should be assessed on its merits as a viable strategy for bulk water supply. This policy consensus has tended to present the challenge to the implementation of water recycling initiatives as social and political. While potable reuse is regarded as both feasible and safe, issues of community acceptance and adverse public reactions are presented as possible barriers, underscoring the need to motivate public acceptance through appropriately designed communication and engagement initiatives (Brown*, et al.* 2009; Hurlimann and Dolnicar 2010).

While the importance of public and community participation has been a notable emphasis of recent policy considerations of potable reuse, it is also clear that this commitment is framed primarily around the implementation of water recycling schemes. Water scarcity is therefore presented as an environmental imperative that drives institutional and technological innovation – while public participation in water recycling tends to be presented as a matter of the social acceptance of technological systems, with limited scope for collective deliberation on the nature of the problem itself (Bell and Aitken 2008; Lejano and Leong 2012; Russell*, et al.* 2008).

As we will explore in subsequent sections of this report, what we have found in our focus group research is a disconnection between the representation of water recycling in national policy literatures and the values that members of the public feel are relevant in understanding and responding to water scarcity issues. As we outline in the Community Engagement guidelines that accompany this report, this points to the need to adopt innovative engagement practices that enable institutions and members of the public to co-establish a set of shared values that will guide future decision-making and planning.

Media Representation

The results of our sentiment mapping and media monitoring research demonstrate that, with some important qualifiers that we outline below, contemporary media coverage of potable reuse has tended to mirror the current policy consensus. In this study we compiled a database of articles in the Australia print media, focused on the period 1990-2014. Analysis of the data suggests there has been an increase in coverage of water recycling issues over the period of the study, and a strong correlation between spikes in coverage and periods of sustained drought, water shortage and restrictions. The data highlights a clear trend in the media coverage of water recycling. Relatively limited coverage across the early years of the sample is evident, in contrast to a marked spike in reporting between 2005 and 2008. Figure 1 is a graphic representation of media reporting on water recycling between 1990 and the present.

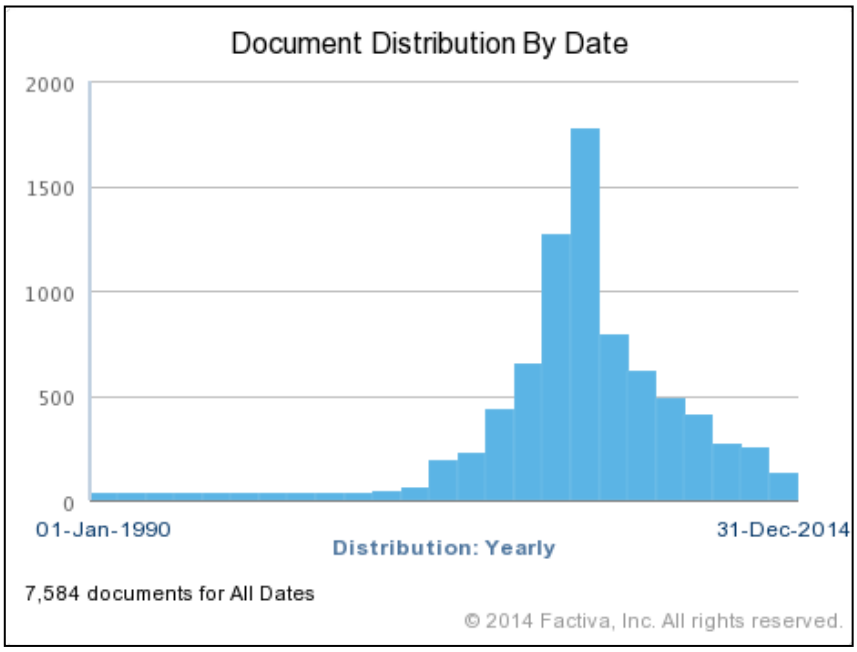


Figure 1: Water recycling coverage in Australian print media, 1990-2014 (source Factiva)

In Figure 2, we see a more disaggregated and detailed representation of the media coverage of water recycling, highlighting the particular spike in reporting during what is often referred to as the Millennium drought, a period of extremely low rainfall that stretched from 2000 to 2012. It is striking to note that the Millennium drought became the focus of extensive media coverage and policy deliberation. The colours in this graph are an indication of the overall sentiment of reporting, where green represents more positive or neutral stories, while red and pink indicate more negative coverage. What we see here is that, in the early years of the sample the coverage of water recycling is generally more positive. In contrast, there is a notable spike in negative reporting associated with public discussion around the proposed development of water recycling schemes in Queensland and the ACT between 2006 and 2007.[6]

[6] For case studies of the governance and regulatory processes surrounding proposed potable reuse schemes in South East Queensland and the ACT see: Carr and Marsden (2013a; 2013b).

Figure 2: Temporal map of water recycling reporting (Source: OpinionWatch)

As we will see in the next section, much of this reporting has been influenced by the ways in which water recycling became the focus of pointed political debates in a series of state elections. In this context, the coverage of water recycling potable reuse issues is strongly associated with notions of controversy and political mismanagement.

In general terms, the aggregate coverage of water recycling indicates a strong correlation with notions of water scarcity, drought and the water restrictions imposed in many Australian cities throughout this period. In Figures 3 and 4, we see a graphic representation of reporting of the relationship between water scarcity and water recycling.

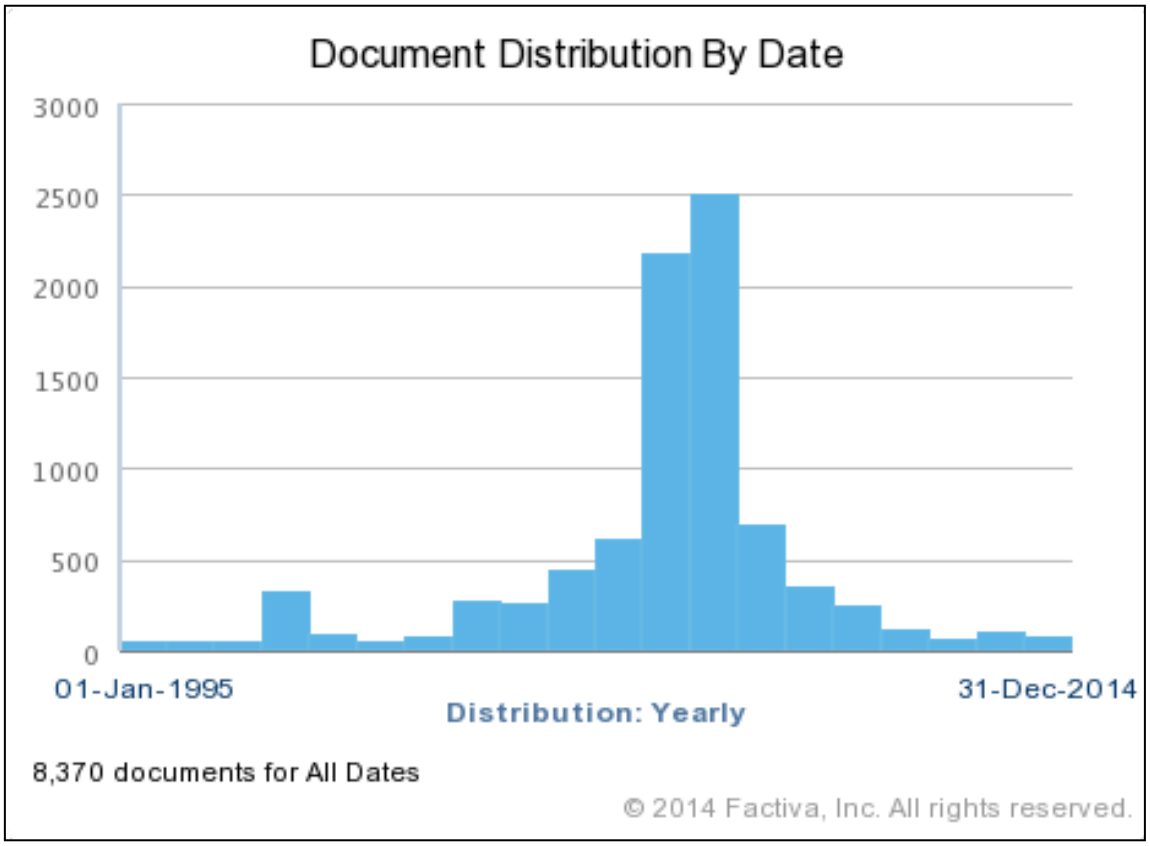


Figure 3: Water crisis coverage in Australian print media, 1990-2014 (source Factiva)

Figure 3 was generated using a keyword search for the term “water crisis” while, in comparison, Figure 4 was generated using the combined search terms “water crisis” and “water recycling”. What we see in Figure 3 is a broadly deployed “water crisis” and “scarcity” narrative that reaches its climax at the height of the Millennium drought.

In addition, Figure 4 clearly demonstrates the inter-connection between media reporting of water scarcity issues and the public discussion and consideration of water recycling.

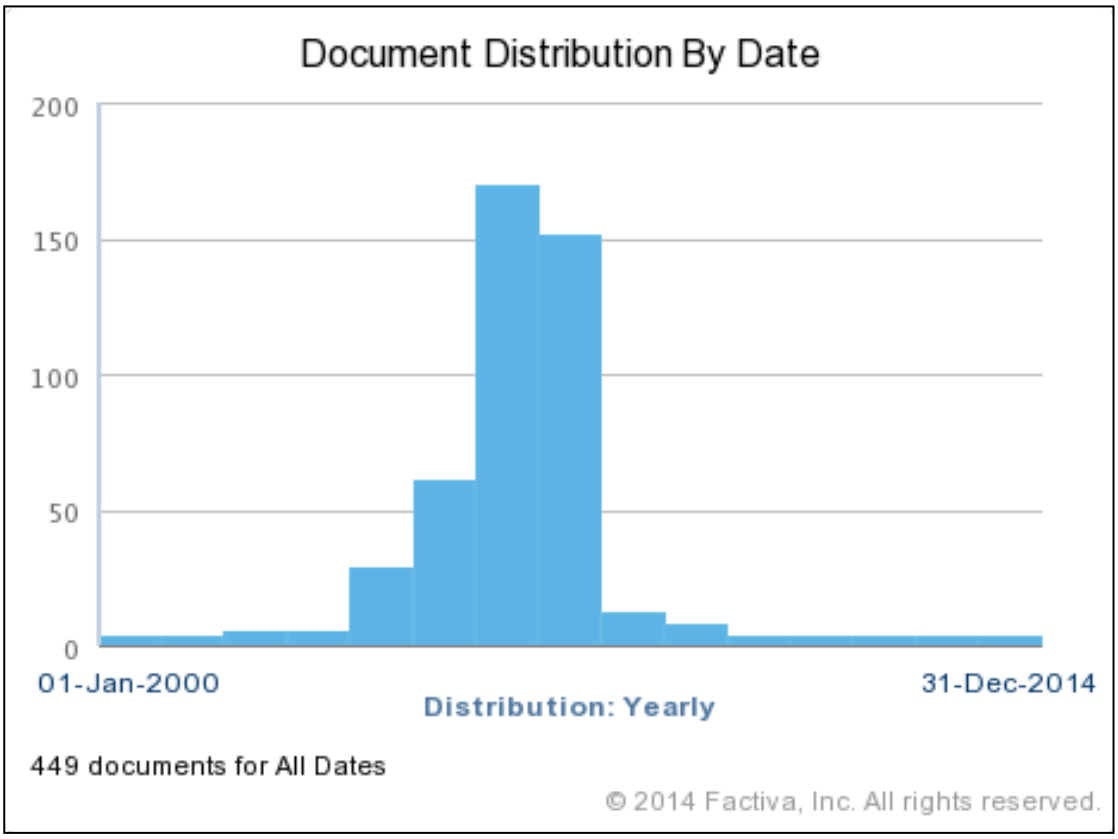


Figure 4: Water crisis and water recycling coverage in Australian print media, 2000-2014 (source Factiva)

A content analysis of this reporting suggests that, while coverage of water recycling is closely linked to notions of water scarcity, this has not translated into universally positive reporting. Take for example the

aap

HD Vic: No desal plant, we have enough water, say experts

following indicative headlines taken from coverage between 2006 and 2007:

The Canberra Times
INDEPENDENT. ALWAYS.

HD Look at demand, not supply, to solve water crisis

FINANCIAL REVIEW

SE Supplement
HD Recycled effluent must pass eventually

The Canberra Times
INDEPENDENT. ALWAYS.

HD Much better options available to address water crisis

While this coverage does not demonstrate consistent support for water recycling, what we see here is the way in which an increasingly entrenched 'water crisis' narrative is framed primarily in terms of technological choices, focused particularly on infrastructure options for bulk water supply. In this respect, although there are significant areas of divergence between the policy consideration of water recycling and media coverage, there appears to be a degree of synchronicity in the framing of water scarcity and alternative supply options. There is now an accepted policy and media narrative that environmental conditions will require water authorities to adopt alternative water provision solutions (Cook and Bakker 2012). It is therefore notable that, in debates concerning the sustainability of metropolitan water supplies, this scarcity and crisis narrative is focused primarily on supply-side responses to water scarcity (Sofoulis, *et al.* 2007).[7] Implicit in much of the media coverage is the suggestion that the general public will struggle to cope with stringent water restrictions.[8]

Social science analyses of alternative water source provision have also noted the ways in which water recycling is framed as a technological response to water scarcity and security. In their study of the factors influencing public perceptions of water recycling Po, *et al.* (2003) observe that "with increasing pressures on water resources, the concept of beneficial use of treated wastewater has rapidly become an *imperative* for water agencies around the world" while also arguing that "water reuse should not be treated simply as a means to an end but should be implemented in conjunction with other water conservation measures" (p. 1, emphasis added). Similarly, in their review of science communication literatures, Green, *et al.* (2010) identify the critical relationship between water scarcity and proposed alternative water supply options. They highlight that "alternative water supply systems are increasingly being proposed, and implemented, to supplement dwindling traditional water supplies" (p. 1. See also Ooi, *et al.* 2014a). Considering the role of public participation in this context, the authors of the review usefully distinguish between approaches that aim to "convince people to accept an alternative water supply scheme" and those that "encourage participation in dialogue about the scheme and hence empower communities to participate in decision-making" (p. 1).

Water politics

The second key theme evident in the media reporting of water recycling is notions of political mismanagement and a broader concern about water governance, conflicts between state and federal governments, and corruption and collusion between the public and private sector. What our analysis points to is the ways in which notions of water scarcity – and indeed notions of a water crisis – have been increasingly reframed through narratives of political mismanagement. In a recent study of Australian water reforms, Edwards (2013) highlights the ways in which notions of a water crisis have bled into broader concerns about perceived shortcomings or failures of state water management practices. In this context, a distinctly environmental framing of water scarcity appears to have given way to a more overtly political media and policy discourse. Edwards argues that "until the late 1980s, it was practically an article of faith in Australia that the recurrent crises of water scarcity experienced in both rural and urban areas were the result of Australia's peculiarly arid and variable climate" (p. 1877). Comparing this with more recent notions of water scarcity, Edwards (2013) continues by suggesting that scarcity crises are increasingly presented as an outcome of the "failure of successive government water-management policies in the context of Australia's climate" (p. 1880). Recent work on Australian media reporting has also demonstrated that crisis narratives across a range of fields – including health, environment and social policy – are increasingly framed through notions of political mismanagement (Power and McLean 2007). As we will highlight in subsequent sections of this report, one implication of this finding is that

[7] We note here a strong urban-rural divide in policy prescriptions regarding water scarcity issues. While approaches to urban water supplies have emphasised the need to generate new sources for bulk water supply, in rural contexts water reforms have largely focused on demand-side innovations and new forms of water governance (Edwards 2013).

[8] There is some evidence to suggest that media coverage of water sustainability issues does not fully align with institutional practice. For example, during the Millennium Drought the SEQ Water Strategy 2010 promoted demand management, water efficiency measures and water restrictions (Queensland Water Commission 2010).

concepts of water scarcity appear to be conflated with themes of political mismanagement in both media reporting and wider public debate. This conflation, which might be understood as a product of recent infrastructure controversies, is likely to shape media reporting and condition public responses to potable reuse initiatives. There appears to be an entrenched set of media frames that represent major water infrastructure projects as politically motivated. In addition, our data suggests that public understandings of water scarcity do not necessarily lead to support for recycled water. While it will be important for water utilities to make a strong case for the need for water recycling, relying solely on messages about water scarcity is likely to intensify existing public scepticism and ambivalence concerning decision-making processes.

White Elephants

Across the period of our study there appears to be an increasingly ingrained narrative that water planning issues and major infrastructure decision-making processes have been politically mismanaged. Critical to this framing has been the way in which a range of alternative water supply initiatives are presented as unnecessary 'white elephants', with coverage focusing on the costs associated with the construction of underutilised infrastructure.

The term 'white elephant' is used to refer to a project that has been foisted upon the public that will continue to cost more in upkeep than it will provide in capital (social, economic, cultural or practical). The 'white elephant' framing has become a dominant theme in the media coverage of major infrastructure projects in Australia.

Figures 5-7 show the frequency of keywords – 'white elephant', 'infrastructure', 'desalination' and 'water recycling' – in Australian media reporting in the period 1988 to the present. What we see in this data is an increasingly well-established media narrative that frames large public infrastructure projects as unnecessary and costly.

An implication of this keyword analysis is that the white elephant framing has exercised a critical influence on the reporting of major infrastructure projects in general. On water issues this framing is particularly prominent in the reporting of desalination initiatives (Herron and Cryle 2011). While the data concerning water recycling is less conclusive, there are indications that the white elephant narrative constitutes a convenient frame in which media outlets situate new initiatives.

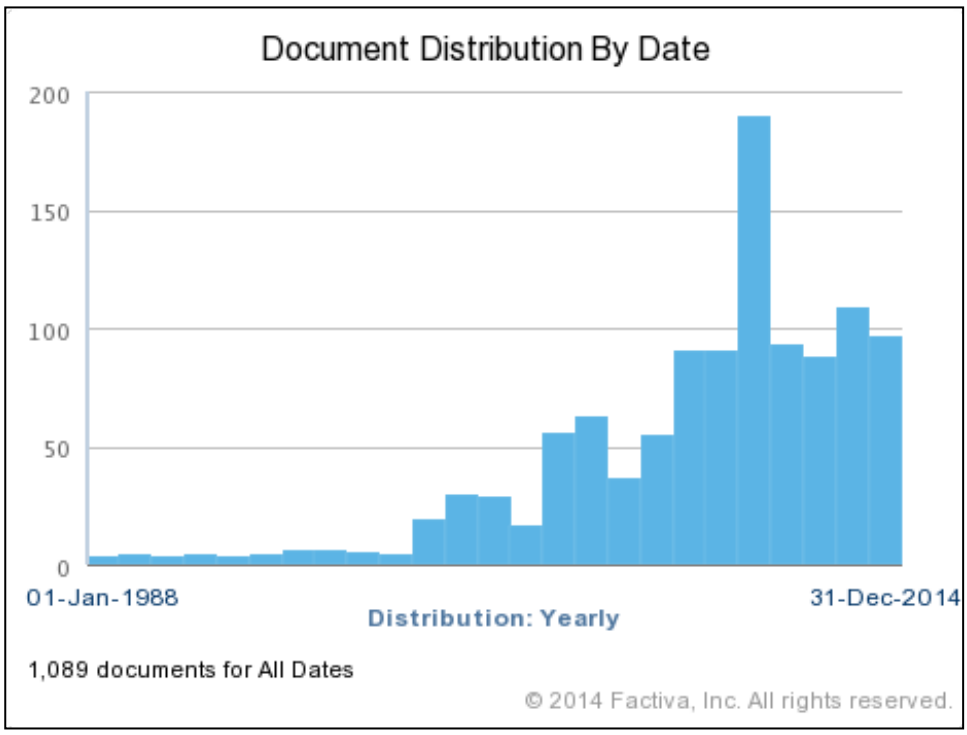


Figure 5: Infrastructure and "white elephant", coverage in Australian print media, 1988-2014 (source Factiva)

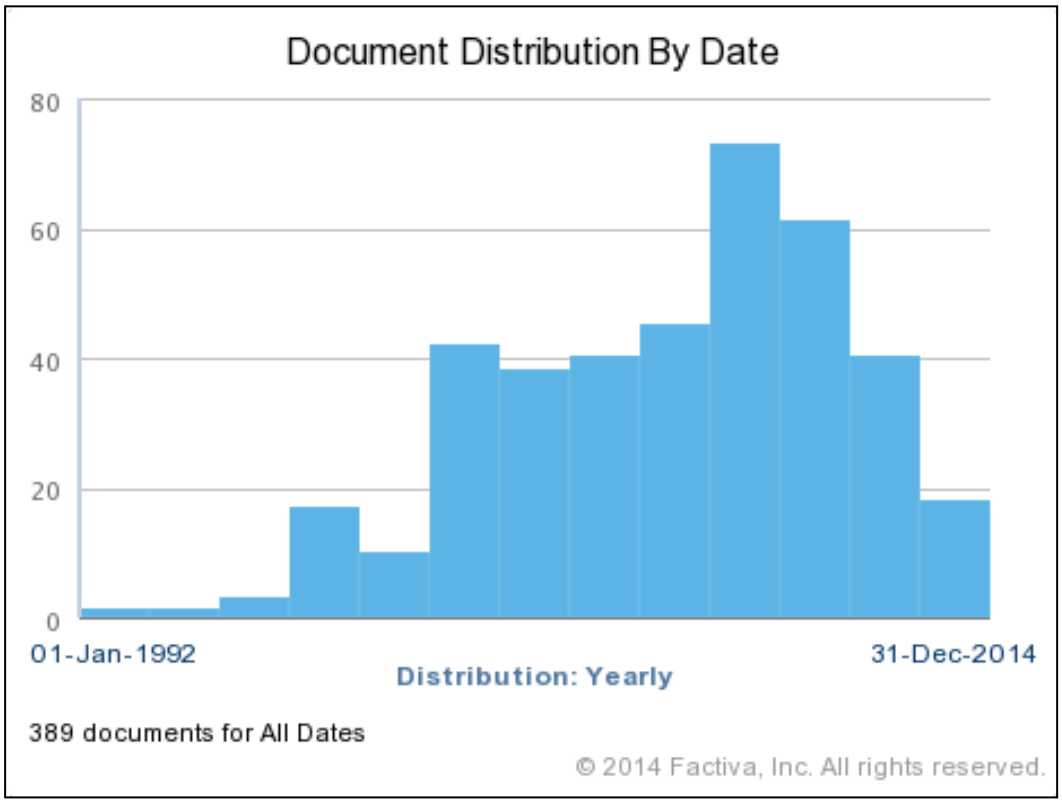


Figure 6: Desalination and "white elephant", coverage in Australian print media, 1992-2014 (source Factiva)

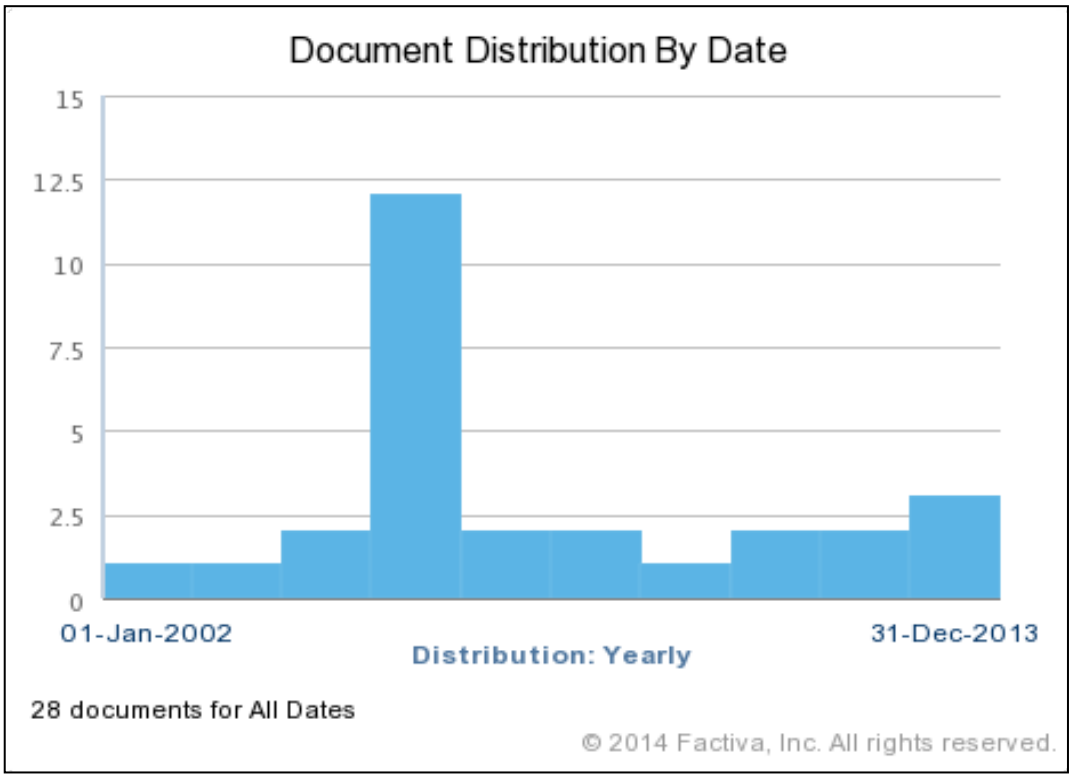


Figure 7: "Water recycling" and "white elephant", coverage in Australian print media, 2002-2014 (source Factiva)

Content analysis of media coverage of both desalination and water recycling indicates that the deployment of the 'white elephant' theme is linked to a series of common political and institutional factors. These include:

- A long-standing incumbent government;
- Concerns about the impost on tax-payers;
- A perceived history of mismanaged infrastructure projects;
- A perception that decisions were taken without adequate thought given to alternatives;
- Insufficient public consultation and engagement, leading to a sense of disenfranchisement; and
- Public-Private Partnerships as the default model for major infrastructure developments.

Another key theme evident in the use of the white elephant narrative is questions concerning the costs of water infrastructure projects, their possible redundancy and eventual mothballing. The following headlines and cartoons are indicative of this framing:

THE AGE

SE News
HD Water fight: fury over $1.5bn plan

The Sydney Morning Herald

SE News and Features
HD Desalination plant to halve output as rains top up dam

The Courier-Mail

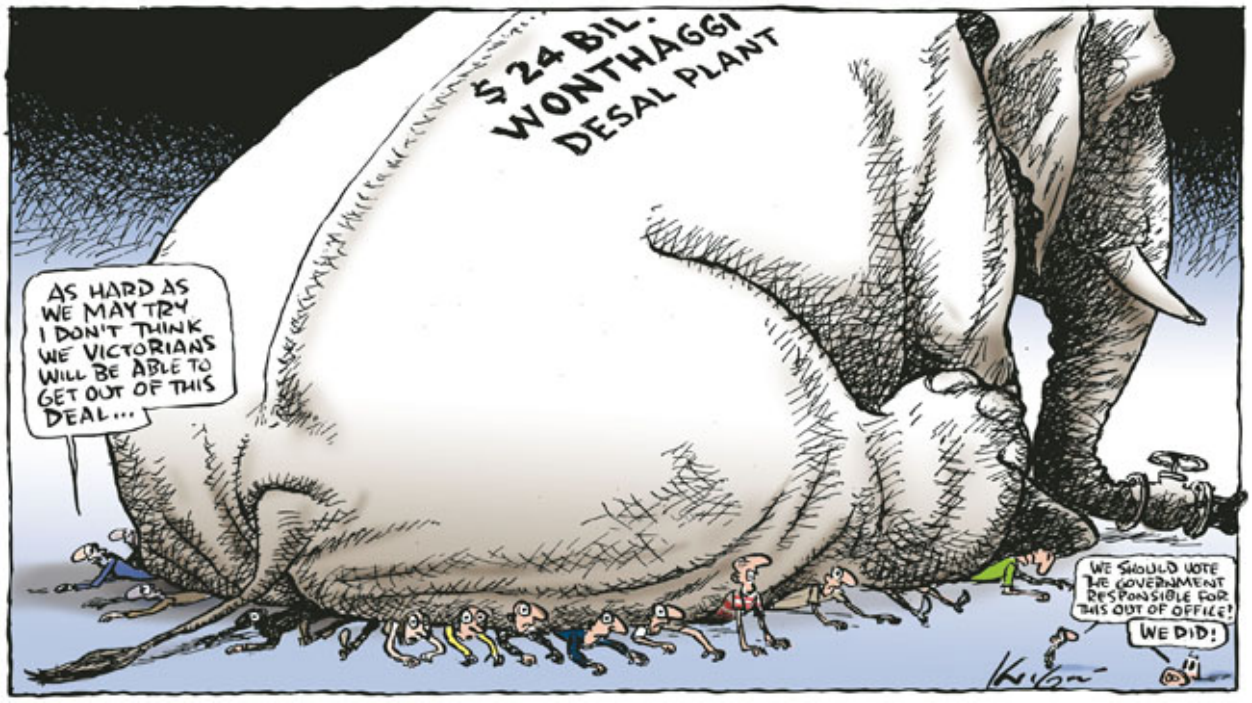
SE News
HD Billions down drain as plug pulled on scheme

The Courier-Mail

SE Features
HD Unwanted and unnecessary

The Courier-Mail

SE News
HD WATER LOAD OF TRUNK - REVEALED State's recycling project a $2.7b white elephant



Source: Herald Sun, 2011

As evident in the cartoon above, the 'white elephant' narrative is also strongly associated with the perception that infrastructure initiatives were conceived and rushed through decision-making processes with a sense of urgency. Critical here is the representation that processes of public oversight were inadequate, with limited scope for active public participation. Reporting has tended to focus on whether major new initiatives are necessary and the perception that alternative approaches were not properly considered.

The Sydney Morning Herald

SE News and Features
HD Real shortage is in brains, not water

THE AGE

SE News
HD More desal plants 'not the answer'

The Canberra Times
INDEPENDENT. ALWAYS.

HD Look at demand, not supply, to solve water crisis

aap

HD Vic: No desal plant, we have enough water, say experts

The Canberra Times
INDEPENDENT. ALWAYS.

HD Much better options available to address water crisis

Water Wars

It is also notable that media coverage of recycled water has escalated in tone over the period of the study. A significant aspect of the heightened tone of much of the coverage is the way in which notions of water crises have taken on a distinctive 'water wars' framing, focused on issues of political conflict and a looming crisis in water supplies. The water war framing represents the confluence of the 'scarcity' and 'white elephant' narratives evident in the widespread perception that political mismanagement, collusion and corruption have prevented governments and water authorities from making appropriate and strategic long-term decisions.

Figure 8 provides a graphic illustration of the frequency of the term "water war" in Australian print media between 1994 and 2014. Although what we see is a relatively modest aggregate total, there appears to be both a concentration and a pattern in the use of this framing between 2002 and 2014. More broadly, we also see a close correlation between the notions of political conflict, controversy and water planning.

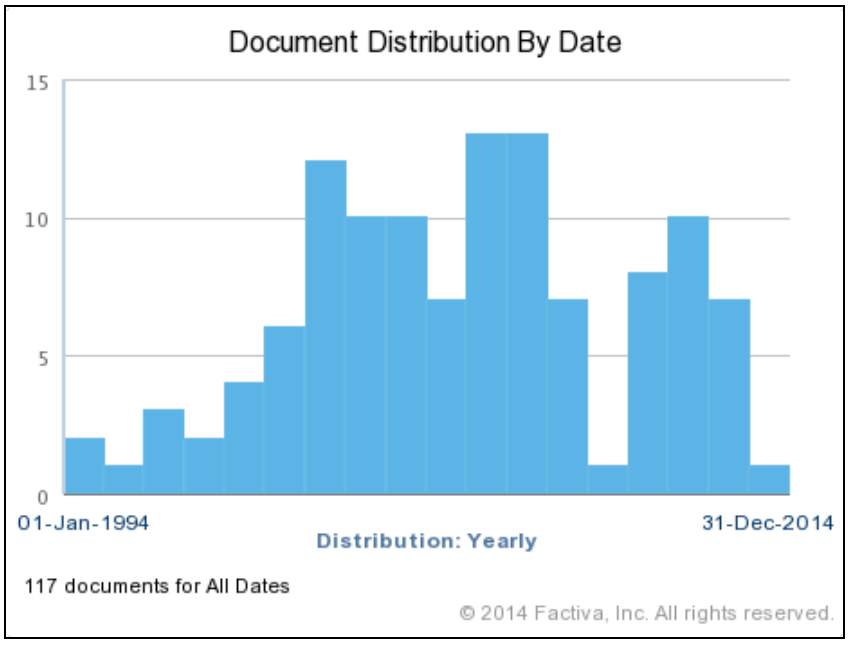


Figure 8: Water war narrative in Australian print media, 1994-2014 (source Factiva)

The water war frame appears in two forms in the coverage of water recycling. The first concerns the notion that decisions around water recycling are shaped by adversarial political arrangements, the contrasting positions adopted by both state and federal governments and the perceived corruption of water planning processes. The following headlines are indicative of this framing:

THE AUSTRALIAN
Australia's national daily newspaper

SE Features
HD Caught in the vortex of NSW gutter politics

THE AGE

SE News
HD Ombudsman probes state water agency

THE AUSTRALIAN
Australia's national daily newspaper

SE Features;Leader
HD THE WATER SCANDAL

THE AGE

SE News
HD Water Wars: Turnbull attacks Victoria over handling of drought

The Daily Telegraph

SE Local
HD Facing political water torture - Nature has its brutal way with the land, its people and our short-sighted politicians

THE AUSTRALIAN
Australia's national daily newspaper

SE Features;Feature
HD Our water crisis is one of management, not supply

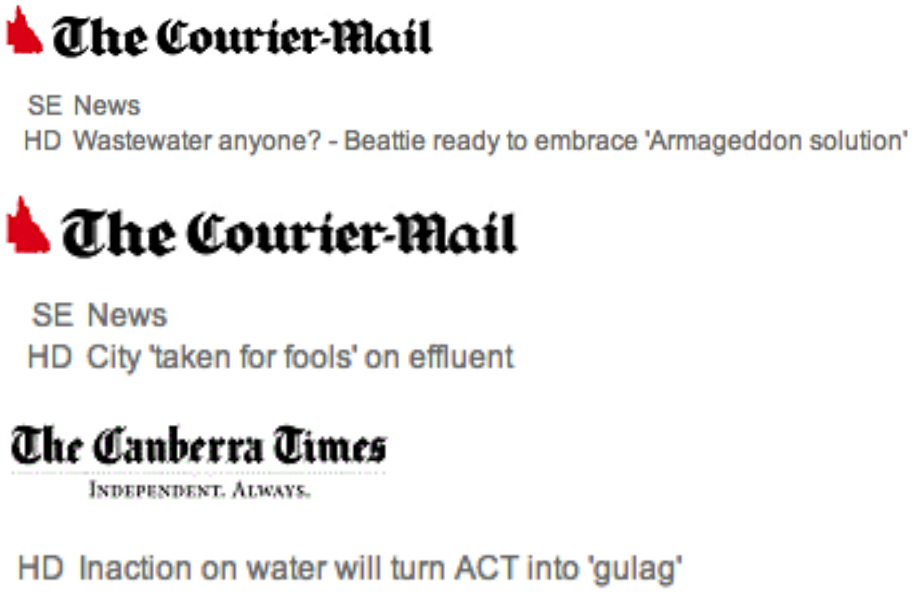
FINANCIAL REVIEW

SE Supplement
HD Recycling keeps on coming back to politics

The West Australian

SE Opinion
HD Take water security out of State agency hands

The second theme evident in this water war narrative is focused on the technologies of water treatment. Here, water recycling, and particularly potable reuse, is presented as an option of 'last resort'. Notably, investment in water recycling is itself presented as a consequence of – rather than necessarily a solution to – a looming water crisis and the perceived history of political mismanagement. Take for example the following headlines:



The water war framing reached a peak in the period 2006-2007 when, at the height of the Millennium drought, state elections along the eastern seaboard coincided with a federal election. In this context, reporting of water planning issues took an increasingly polarised tone, while issues around alternative water source initiatives became the focus of intense public controversy. As we discuss below, for members of the public, the perception of political collusion in decision-making exercised a significant influence on the response to water recycling, while focus group participants also suggested that the crisis narrative in much of this coverage had been manipulated to justify broader institutional agendas. As we will outline below, across our focus group discussions we found a widespread perception that large infrastructure initiatives were unnecessary and costly and that planning processes had not sufficiently reviewed alternatives. This perception contributed to a scepticism that many of our focus group participants felt in response to institutional messages concerning water scarcity.

Cost and Fairness

It is also evident that recurrent themes in the media coverage of potable reuse concern issues of cost and the broader economic impact of water recycling initiatives. This framing is especially evident in the period 2006-2007 and the coverage of the proposed implementation of potable reuse schemes in Toowoomba and the ACT. Figure 9 provides an indication of the spike in coverage between 2006 and 2007 which links water recycling with concerns about cost. During this period a significant feature of the coverage concerned the possible impost on tax-payers due to the proposed construction of water recycling initiatives.

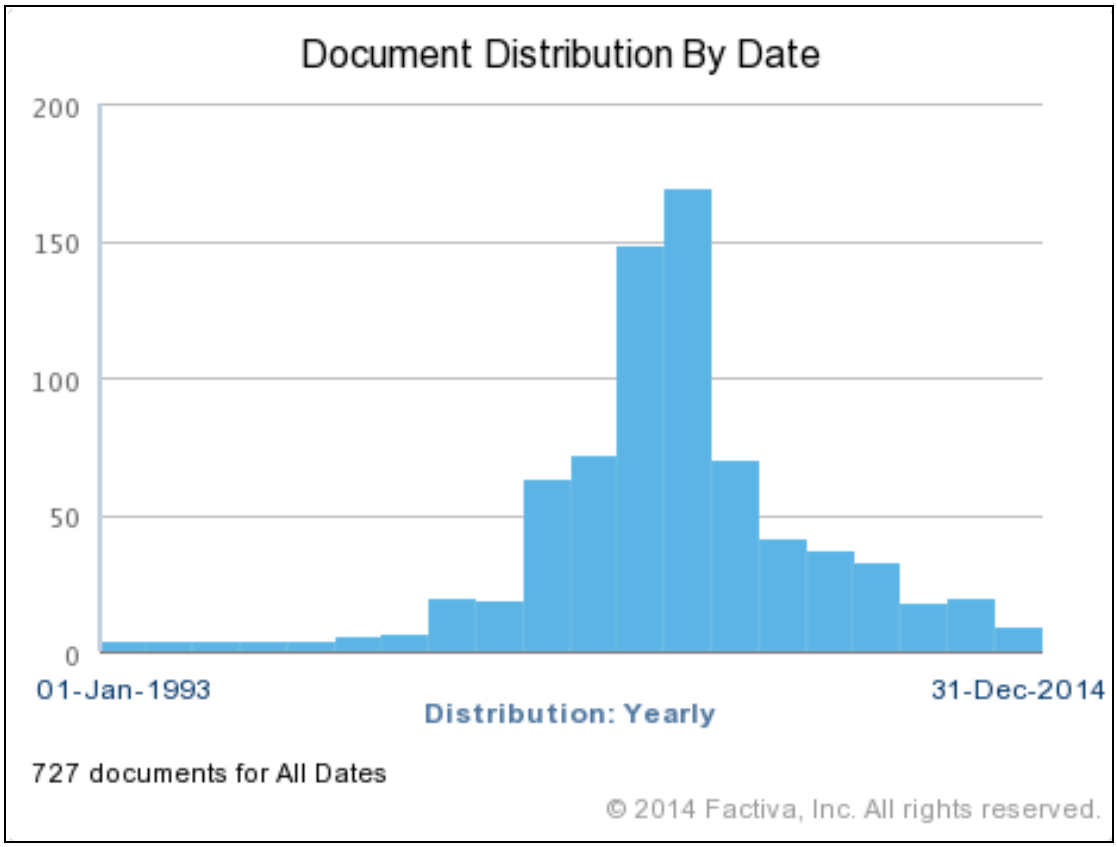


Figure 9: "Water recycling" and cost in Australian print media, 1993-2014 (source Factiva)

It is also evident that issues around cost and economic impacts feature consistently in the coverage of alternative water source initiatives more generally. While in broad terms, much of the coverage has focused on public expenditure, a particular focus of this reporting is the possible differential impacts associated with water recycling initiatives and the need to more equitably allocate water and infrastructure expenditure. Our analysis suggests that implicit in this framing are concerns about fairness, equity and social justice.[9]

The following headlines are indicative of this theme:

THE AUSTRALIAN
Australia's national daily newspaper

SE Finance
HD Water recycling costs `must be shared'

THE AGE

SE News
HD Affluent effluent fouls sewage recycling scheme

[9] Our finding here is also consistent with public attitude research conducted for the NDEEP project. See: Ooi, *et al.* (2014d)

Learning from Controversy

The third key frame – especially evident in scholarly analyses and recent policymaking – is what we term a 'learning from controversy' narrative.

Recent scholarly analyses have focused particularly on understanding the factors that underpinned the results of the 'Toowoomba Water Futures referendum' (2006). In this referendum, focused on the proposed construction of a potable reuse facility in Toowoomba, a regional town in Queensland, 62% voted 'no' in response to the question "Would you support adding purified recycled water to Toowoomba's water supply via Cooby Dam as suggested by Water Futures – Toowoomba?". In recent work, the results of the Toowoomba referendum have been explained primarily as a failure of 'public acceptance'. Social science analyses have highlighted the rise of adverse public attitudes and perceptions of risk, notions of the public's innate fear of the unknown and the role of activist social movements in shaping responses to the Toowoomba referendum. For example, in their analysis of these events, Hurlimann and Dolnicar (2010) summarise the central arguments mounted in opposition to the construction of the planned facility: that people "were worried that their image as Garden City would change to an image of being the 'Shit City'", "residents were concerned that Toowoomba would become less attractive to businesses, industry, families, retirees and travellers" and the persistence of a range of health concerns; "they were not sure if they could trust science; they were irritated that the Toowoomba Council refused to state that the water was 100% safe and stated that they felt like lab rats" (p. 292).

Significantly, Hurlimann and Dolnicar (2010) interpret these concerns as a product of informational barriers and the role of oppositional social movements that formed around the referendum.[10] They suggest that the "main barrier … was the need for accurate information which was 'untarnished', 'unbiased', 'scientific', and 'the truth'" and emphasise the "need to provide unbiased and impartial information" (p. 295). Analysing the role of groups, such as the 'Citizens Against Drinking Sewage' (CADS) – who formed in direct opposition to the planned recycled water facility – Hurlimann and Dolnicar suggest that the "CADS benefited from a 'First Mover Advantage'… Being the first to communicate with the public, they became the benchmark information source for matters relating to the proposed recycling project" (p. 289). More broadly, the 'No' vote in the Toowoomba referendum has also been explained as a political failure; with commentary focusing on the inherent weaknesses of plebiscites and direct democracy in matters concerning complex technological decision-making, the vested interests of local politicians and the relative ease with which activist groups were able to 'sway' public opinion (Hurlimann and Dolnicar 2010).

In this sense, the social and institutional learning that has been engaged around the failed attempt to construct a water recycling facility in Toowoomba has largely adopted a 'deficit model' framing and focused on the adequacy of institutional risk communication strategies. The assumption, implicit in this work, is that public concerns about scientific and technological developments are precipitated by a 'deficit' in public understanding, a lack of reliable information and the asymmetric influence of activist groups in shaping public responses (Wynne 2006; 2008). In addition, a common implication of the deficit model is the supposition that "greater public knowledge of science will lead to a more welcoming public climate for scientific and technological developments" (Irwin and Michael 2003, p. 23). In light of the controversies that surrounded the proposed implementation of potable reuse schemes in Queensland and the ACT, the future development of such initiatives is commonly presented as being dependent on the public acceptance of such initiatives. This, in turn, has prompted a range of public information campaigns and risk communication initiatives, based on the premise that: recycled water *should* be considered an option for alternative water provision; *all water* is recycled, owing to the natural action of the water cycle; recycled water *is* safe; and public acceptance will be critical to ensuring that recycled water remains a viable political option (Simpson 2008; Simpson and Stratton 2011).

Embracing Engagement

At the same time, and in parallel with shifts in approaches to science and risk communication (Beck*, et al.* 2014; Chilvers 2013; Chilvers and Kearnes 2015; Pallett and Chilvers 2013), the analysis of public responses to recycled water has begun to emphasise the need to move toward more participatory approaches to public and community engagement. For example, in their analysis of voting behaviours, and the positions adopted by supporters and opponents of recycled water in the Toowoomba case, Price*,*

[10] Hurlimann and Dolnicar (2010) highlight the role of groups such as 'Citizens Against Drinking Sewage' in providing a locus for opposition to the Toowoomba facility.

et al. (2012) highlight key areas of possible institutional learning. They argue that water authorities need to "develop more effective communication and engagement programs" while policymakers need to "construct messages that address the diverse concerns and needs within communities" (p. 992). In addition they also highlight that "when authorities implement processes that are considered fair, such as consultation processes giving voice to individuals, industry, and community more broadly, there will be greater trust and acceptance of decisions" (p. 992).

A range of recent policy reports concerning recycled water has come to the same broad conclusion: that, although public acceptance is likely to constitute a key determinant for the successful implementation of water recycling schemes, effective public participation and community engagement provide a way of managing public concerns (Khan 2013; National Water Commission 2010; Productivity Commission 2011).

It is notable that this commitment to deliberative public participation in decision-making sits uneasily alongside an emerging media narrative that presents drinking recycled water as 'inevitable'. Take for example the following headlines drawn from recent media commentary:

Drinking recycled effluent 'inevitable' in smarter Australia

Recycled water inevitable in NSW, says PM

Reporter: Peter McCutcheon

Recycled water will become the norm, experts say - once we get over the 'yuck factor'

From toilet to tap: Getting a taste for drinking recycled waste water

By **Kieron Monks**, for CNN

May 1, 2014 -- Updated 1446 GMT (2246 HKT)

The Water Minister says Perth residents will eventually drink recycled water.

Updated Wed 4 May 2011, 3:21am AEST

'Get used to it': A glass of recycled sewage.

What we see in this reporting is two central arguments. Firstly the development of water recycling schemes to augment existing drinking supplies is increasingly being presented as an unavoidable development, driven by environmental, social and economic factors. Secondly, while public concerns are acknowledged – and the potential for potable reuse initiatives to precipitate controversy – the broad narrative here is that the public will need to 'get over' these concerns and 'get used to' drinking recycled water. Implicit in much of this coverage is the notion that public concerns about recycled water are a product of what is now commonly referred to as the 'yuck factor': an instinctive reaction against drinking treated wastewater. In recent coverage we have seen a confluence of 'toilet-to-tap' representations of recycled water – often in the form of humorous cartoons – together with the belief that drinking recycled water will be inevitable. The 'get over it' narrative is therefore explicitly linked to the view that public concerns about potable reuse are inherently irrational.

A striking feature of this framing is that it is based on media reporting of policy interventions that advocate more inclusive forms of public participation in decision-making. For example, a recent report published by the Australian Academy of Technological Sciences and Engineering concluded that, though "public acceptance remains an important and sometimes difficult issue for all planned potable water projects…there is evidence to suggest that acceptance is increasing generally and can be fostered by effective engagement and communication programs" (Khan 2013, p. 119). It was notable that media coverage of the report adopted a more emphatic tone, downplaying the need for thorough public participation and consultation in favour of the notion that drinking recycled water would be unavoidable and that the public would need to 'get over' remaining concerns. The author of the report was quoted as

suggesting: “in the long term, I see direct potable reuse as being universally inevitable. I see that if we are going to have increasing population pressures, potentially increasing climate pressures in many areas, we really do need to get a lot smarter about this one-directional use of water” (Khan quote in Dowling 2013).

What we see here are two contradictory narratives: a participatory manoeuvre that emphasises deliberative and inclusive decision-making and a narrative that positions potable reuse as unavoidable and thus demands that publics “get used to” drinking treated wastewater. As we outline below, this contradiction underscores a lack of clarity evident in institutional commitments to public participation in planning processes.

Implications

In the following section we outline a series of implications that we draw from our analysis of media and policy framings of potable reuse. These implications were significant in informing our subsequent empirical and qualitative research.

Agenda Building

Our analysis suggests that the water industry does not appear to be driving agendas around potable reuse. In the context of a relatively disaggregated policy landscape, and the implementation of a series of policy bans in many states, advocacy of potable reuse appears to lack institutional champions. In contemporary media coverage our results suggest that, while most reporting on water recycling tends to be either positive or neutral, the implementation of potable reuse schemes remains controversial. In this context, negative media frames appear to be relatively well-established, with questions of political mismanagement, expediency and the economic impost of major infrastructure projects dominating coverage.

More generally, there appears to be a well-entrenched pattern of reporting that suggests that water planning and decision-making processes – particularly those associated with large capital expenditures – are influenced by short-term political and commercial imperatives. This framing exercises a significant influence on media reporting of water recycling.

The media coverage of water recycling also tends to occur in isolation from a broader consideration of questions concerning water sustainability and demand management. Media coverage of potable reuse is shaped by the dominant imagery of drought and water scarcity in Australia. Aside from reports focused on the introduction of water restrictions, media representation of water scarcity and drought commonly adopts iconic and largely rural images of parched landscapes. In this sense, drought is imagined as primarily a rural issue whereas the long-term sustainability of metropolitan water supplies lacks an equivalent iconography (Wahlquist 2003). This suggests that, while policy discussions have largely positioned water recycling as a response to water scarcity and the environmental and demographic factors that shape long-term water supplies, these messages do not appear to resonate with the reporting of urban water issues.

Polarisation

Our analysis also suggests that the media consideration of water recycling is characterised by a relatively limited set of voices and ‘trusted sources’ – both positive and more critical.

Figure 10 is a topic map showing keywords associated with the search term ‘Collingnon’ drawn from our OpinionWatch database of media reports on water recycling. As the graph shows, Professor Peter Collingnon – who voices concerns regarding levels of pharmaceutical contamination in recycled water – is routinely approached for comment regarding proposed initiatives. The graph also shows that Dr Stuart Khan, an advocate of direct potable reuse, is regularly cited for positive comment in the same reporting. As the above topic spread shows, Dr Khan is often quoted in articles in which Collingnon is also featured.

It is quite likely that the limited number of voices in mainstream media is a result of journalistic and reporting practices. Key here is the commonly accepted journalistic norm of balance and objectivity, which tends to present controversial issues by juxtaposing contrasting perspectives. In some cases this can result in “giving equal airtime to opinions viewed as marginal or non-expert” (Price*, et al.* 2012, p.

981), while it is also common to deploy expert sources in ways that tend to equate the expertise of these voices.

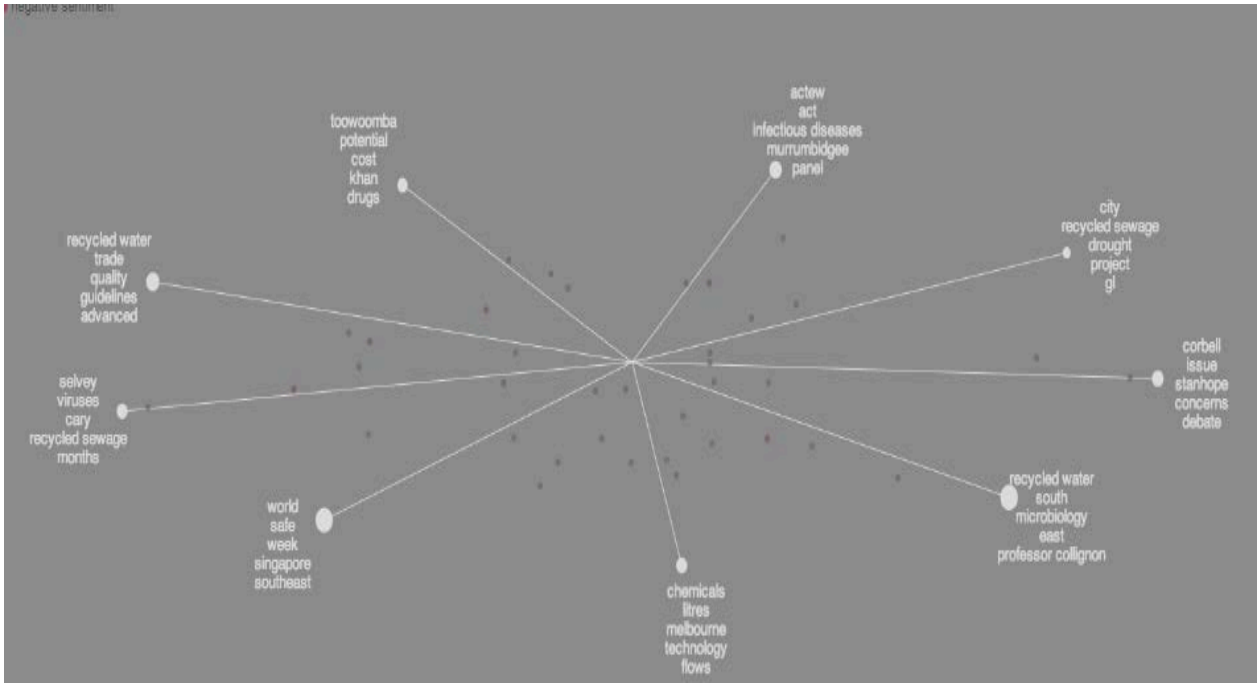


Figure 10: "Collingnon" sentiment map (source OpinionWatch)

Ambiguities About Community Engagement

Our analysis also suggests that, although there appears to be a clear embrace of more participatory modes of public and community engagement – distinct from communication initiatives underscored by the deficit model – there is a lack of clarity around the purpose and intentions of these practices. A question remains about whether community engagement practices will be designed solely to build public trust in the implementation of water recycling initiatives – in other words, in ways that tend to restrict the scope of public participation. Our analysis in this chapter suggests that, while there is clear evidence of positive institutional learning, particularly with reference to the Toowoomba referendum, official commitments to public participation in decision-making appear to be contradicted by an emergent policy and media frame that presents potable reuse as inevitable, and any concerns as something the public needs to 'get over'.

We argue that what we see here is characteristic of the recent turn toward more dialogic modes of decision-making on a range of scientific, technological and environmental issues, in which there has been a tendency to prescribe both the scope and parameters of public participation to pre-determined policy objectives (Callon*, et al.* 2009; Irwin 2006; Stirling 2008). In this context it remains to be seen whether the commitment to more deliberative models of community engagement will enable a more generative, diverse and open consideration of the nature of water scarcity and security, and the sociocultural dynamics underpinning these issues.

Chapter Summary

In this chapter we have outlined our analysis of the framing of potable reuse in contemporary policy-making, media reporting and social science analysis.

In this chapter we have seen that:

1. Three principle frames are evident in policy discussions and media reporting of water recycling – 'scarcity', 'water politics' and 'learning from controversy';

2. Major water infrastructure projects are therefore typically interpreted as ‘white elephants’, with concerns about unnecessary expenditure, costs to the general public and notions of fairness and equity dominating media reporting;

3. In policy and social science literatures there has been a conscious effort to learn lessons from the controversies that surrounded the proposed implementation of potable reuse schemes in Queensland and the ACT;

4. These analyses have emphasised the importance of generating ‘public acceptance’ of water recycling and advocated that forms of public participation and community engagement form a core component of the development of potable reuse schemes;

5. This commitment to public and community engagement sits uneasily alongside an emergent framing that presents potable reuse as an ‘inevitable’ development, and further that members of the public will simply need to ‘get over’ concerns about drinking treated wastewater.

Chapter 3: Public Water Idioms

In our focus group research, we commenced by asking people to reflect on what water meant for them, and used a range of stimulus material to generate discussion around water recycling and potable reuse. This approach was informed by a tradition of interpretive analyses in the social sciences – a style of research that aims to explore the accounts people give of their own lives and actions and how people make them meaningful (Boltanski and Thévenot 2006; Geertz 1993; Weber 1978). Our approach might be distinguished from the methodological individualism that has tended to characterise research on public attitudes to science, risk and the environment (Joffe 2003; Kearnes*, et al.* 2014; Macnaghten*, et al.* 2015). For example, much of this research has focused on processes of individual and intrapersonal information processing and relatively static dispositional factors that influence people's beliefs and preferences. One implication of this individualist approach is that the public is typically depicted as an "aggregate of atomised individuals with no social composition, hence no legitimate autonomous cultural substance" (Irwin and Wynne 1996, p. 215). In contrast, an interpretive approach seeks to understand the ways in which people make sense of the world around them and the way in which processes of 'collective sense making' are underpinned by commonplace idioms, stories and narratives (Bal 1997; Billig 1987; Heller 2006).[11]

In this project we developed this interpretive approach by exploring and analysing narratives – or what we refer to here as 'public water idioms' – that people drew on in thinking about water. Our use of the term 'idiom' in this chapter is intended to convey the ways in which public responses to recycled water are shaped by and reflect a set of shared *cultural meanings.* Rather than simply being individual attitudes, beliefs or preferences, these idioms function as commonplace interpretive resources which members of the public use in making sense of new and novel developments (Kearnes*, et al.* 2014). As we will explore below, what our research points to is the ways in which water is associated with the values of fairness, commonness and justice. As we will argue in the following chapter, these idioms spoke to the rich symbolic meanings of water and constituted a shared way of understanding the ways in which water is entwined with social, political and economic relations. These idioms also function to help members of the public 'situate' new developments – such as water recycling and potable reuse – in an interpretive and cultural framework (Macnaghten 2010). We also argue that these idioms are more than symbolic. Rather, people's response to water recycling is also shaped by the felt experience of systems of water provision – the embodied memory, experience and perception of processes of water planning and the political and economic interests that underpin them. In our research, we found that water was strongly associated with the norms of equity, justice and commonness and, in turn, these values influenced people's understanding of the history of water management in Australia and what were felt to be the likely implications of new initiatives.

In this chapter we suggest that our research points to the importance of these idioms in the ways members of the public think about water recycling, and a disjuncture between the ways in which potable reuse is framed in policy and media coverage and the kinds of values people feel *should* guide decision-making.

Cultural History

What we found in our focus group discussions was that people have rich – and at times contradictory – understandings of water that are informed by history, memory, personal experience, and symbolic meanings (Head 2008; Strang 2004).

[11] This approach is also based in our own research practice in which we have deployed narrative analyses across a range of fields. See for example: Davies, *et al.* (2009a); Davies, *et al.* (2009b); Kearnes and Wynne (2007); Macnaghten, *et al.* (2010); Motion (1999); Motion and Doolin (2007). As scholars working in the field of Environmental Humanities, we are also committed to the view that environmental issues – and the controversies that surround areas of scientific and technological innovation – are entangled with social and cultural practices and questions of value, meaning and ethics. In this context see also Rose, *et al.* (2012).

Water and the Australian Identity

Critical in our discussions was the particular climatic and environmental conditions that have shaped the emergence of the Australian nation. For example, a participant from the St Albans focus group spoke vividly of the critical role of water in Australian environmental history, and the importance of drought and fire in forming a sense of a national identity, suggesting:

> "[Our] nation, we have been born of drought and born of fire."
> St Albans Focus Group, Melbourne

Here we see the ways in which water is encoded with the mythologies of nationhood and rich narratives of national character, birth and origins. Discussions across our focus groups echoed consistent themes evident in popular historical accounts of the importance of water in the post-colonial settlement and development of the Australian landscape. For example, the popular historian Cathcart (2010) argues that "the history of Australia could be written as a struggle to conquer two obstacles – great distances and a lack of water" (p. 1). In a similar fashion, participants in the Perth focus group discussed the vulnerability of everyday life to environmental change and lack of adequate and sustainable water supplies. For example, one participant stated that:

> "I think everyone will say Perth is dry. I mean, no one would dispute that."
> Perth Focus Group

In this discussion, our focus group participants consciously retold the 'lucky country' (Horne 1964) narrative, that has tended to depict Australia as blessed with an abundance of natural resources. For our focus groups, water scarcity and vulnerability to extreme environmental conditions – rather than limitless supplies – were regarded as definitive in the national imagery.

Aesthetic Images of Water

At the same time, water also evoked for our participants iconographic meanings, linked to notions of the sublime, the spiritual, the aesthetic and bodily pleasures. Alongside narratives concerned with its absence, and the embodied experience of water, participants spoke of its preciousness and centrality in everyday life. Participants graphically described the importance of water in a range of recreational activities and aesthetic pursuits. For example, one participant, from the Eastern suburbs of Sydney, commented on the importance of swimming and the bodily immersion in water in the routines of her everyday life:

> "I think it's a sensory thing. Like when you're in the water, it calms you down. I swim every morning. If I get to work and I haven't been in the ocean, I can't start my day or can't concentrate."
> Eastern Suburbs Focus Group, Sydney

Throughout our focus groups there was an important shift in discussion when the groups began to discuss how water is used and allocated. For some participants the use of water was embedded in cultural memory and the routines of everyday practice ("I think how people treat water is how they grew up with it." Mudgee Environmentalists), while other participants indicated deep anxieties with current water use practices.

A farmer in one of the Mudgee focus groups evoked the historic consequences of settlement as a way of narrating current debates concerning water allocation and distribution:

> "We are still coming to terms with how we use water. Two hundred years later we have worked out maybe this isn't the right way. We are now trying to figure how to readjust that without crippling land and communities."
> Mudgee Farmers, Focus Group

At the same time, participants also indicated the continuing relevance and presence of alternative ways of understanding and relating to water. Here, notions of respect for country, ethics and values were particularly evident in the focus group discussions. For example, a participant in one of the Mudgee focus groups spoke of the importance of indigenous ways of caring for water and their relevance in contemporary management practices:

> "I like to think that Indigenous people that looked after this country would have looked after it for a reason."
> Mudgee Environmentalist, Focus Group

Community Water Values

Across our groups, a consistent theme of the discussions was the ways in which participants articulated the relationship between water and concepts of shared values and obligations. Water evoked concepts of respect, care, gratitude and responsibility. For example, participants spoke of water in the following terms:

> "We need to be more respectful and thoughtful of how we use water for our future generations."

> "We have to be careful with how we use water and what we use it for."
> St Albans Focus Group, Sydney

> "Water is something precious. And we don't value it because it's so accessible."
> Eastern Suburbs Focus Group, Sydney

> "So the first thing that I would think of is not to pollute it in the first place."
> Adelaide Hills Focus Group

> "It comes down to a sense of community."
> Perth Focus Group

> "Whilst we're moving forward, we're forgetting about who we're leaving behind."
> Mudgee Environmentalist Focus Group

Critical to these values was a notion of a communal relationship with water and concepts of equity and fairness in its distribution and allocation. The terminology of fairness was articulated through the belief that all Australians should have access to the same quality of water. Participants consistently resisted the possibility of different segments of Australia having differentiated, or lower quality, water supplies. As we discuss in more detail below, when considering potable reuse people had serious concerns that disadvantaged groups would have limited choice in accepting recycled water, while more privileged groups might be able to purchase 'premium water'. For example, a participant in the Eastern Suburbs focus group argued that:

> "I think definitely there shouldn't be any choice. Everybody in Australia should have the same water going into their tap."
> Eastern Suburbs Focus Group, Sydney

Equity and Fairness

A consistent theme across the focus groups was that access to clean and low-cost drinking water should be considered a basic right of all Australians. Alongside notions of fairness, participants expressed the need to equitably share the burden of water management and necessary water restrictions in times of water scarcity. This concept of equity was particularly evident in the ways in which participants spoke of the role of different social groups and institutions. A common perception throughout the focus groups was that, while industry and agriculture constituted the heaviest water users, members of the public were required to shoulder the burden of water restrictions and increasing water costs:

> "The amount of water that you as a single person use throughout the year, is miniscule compared with what industry uses, and when there's a water shortage we are supposed to sacrifice – old people are supposed to lug buckets out to water their lawns, but the big business people, they're still using all that water?"
> Adelaide Hills Focus Group

Notions of equity were also tied to concepts of environmental justice, and that shared water values should apply equally to all citizens and institutions. Participants who felt that equity was an important

value in the management of water had difficulty understanding why some people failed to conform to societal expectations regarding appropriate water use:

> "Some people don't give a stuff. Why don't they care?"
> Adelaide Hills Focus Groups

At the same time, some participants were able to speak about the inconsistency between their sense of the shared values of water and their personal, everyday practices. A striking example was a brief interchange in the Perth focus group, in which one participant confessed that he was a 'water pig':

> "They've got enough water for pigs like me to use while everyone else is being conservative with it really. I mean there's always going to be people who bend the rules and all that sort of thing, and there's lots of grey areas out there".
> Perth Focus Groups

Critically, for other participants, the concept of equity was important, not only for their own sense of personal responsibility, but also in judging others' actions. After the participant quoted above confessed to being a 'water pig' the interaction in the focus group centred on notions of collective obligation and censure, as illustrated by the following discussion:

> "And I'm thinking, you know, [about] my children's future and the rest of the world and, you know, if we don't start now, then when? So I think it's a rather selfish attitude just because you can afford to pay for it, you know, that you can just keep helping yourself and just do as you please."
>
> "It's kind of a bit arrogant to just say, well, 'I can afford it, stuff the rest of you' - we'll all end up in the same situation if you flush your toilet ten times a day."
> Perth Focus Group

Water Politics

What we see in our focus group discussion is the ways in which concepts of equity, fairness and justice operate as shared idioms that shape public understandings of water use and allocation. Recent work in organisational studies has highlighted the notion of 'common starting points' as a way of conceptualising the alignment of values between organisations and their publics (Motion and Leitch 2002; Van Riel 1995). In a similar sense, in our focus groups what we see is the negotiation of the public meanings of water through appeals to 'common wisdom', informed by the symbolic meanings and cultural associations of water. In his discussion of this form of common-sense wisdom Billig (1987) argues that "it is easy to think of common-sense as consisting of the communal wisdom which stamps the thinking of all members of a particular community. However, common-sense may not be a unitary store of folk wisdom but, instead, it may provide us with dilemmas for deliberation and controversies for argument" (p. 222). In this sense the values that populated our focus group discussions are not necessarily an expression of shared norms, but might rather be understood as an articulation of the parameters of a shared problem or dilemma.

Just Water

What is evident in our focus group discussions was the ways in which concepts of equity and fairness operated as a normative foundation that participants suggested *should* underpin collective relations with and decision-making about the future management of water. However, it is also notable that these values stood in contrast to participants' personal and felt experience of contemporary water management and the interests that were perceived to be central to the allocation of water. A persistent theme across our focus groups was the sense of disempowerment in light of existing decision-making processes. This was commonly expressed as an awareness of the interests that influenced political decision-making. Take, for example, the following interaction from the Rouse Hill focus group:

> "Who's in charge? The developers."
> "The council are very focused on business and revenue."
> Rouse Hill Focus Group

What is striking here is the ways in which the concepts of equity and fairness were perceived as absent from contemporary political processes. Participants spoke powerfully of their personal experiences of decision-making processes, in ways that made their articulation of these values all the more salient. For

our participants, the perceived unfairness and inequity of existing decision-making processes rendered the articulation of these values, as norms that should guide the allocation of water, all the more apposite. Take, for example, the following extract from the St Albans focus group:

> "You've got the rich and they're being looked after first... St Albans is a forgotten area."
> St Albans Focus Group

What we see in this discussion is the perceived injustice of contemporary planning processes, and the notion that political priorities are negotiated for the benefit of unacknowledged social, economic and political interests.

A striking feature of our focus groups was the ways in which this sense of justice was shared across both urban and rural groups. Though these groups had very different relationships with water, equity and fairness in the allocation and distribution of water was articulated as a quintessentially Australian value. Participants in the Mudgee focus groups spoke eloquently of a sense of an historic injustice, which they located in the separation between land and water and the privatisation of water rights throughout the late 1980s-90s. These political and economic dynamics shaped discussion of contemporary water allocation issues. Take, for example, the following interaction:

> Participant 1: "We have a massive amount of rainwater. We didn't want to be without rainwater. The water that we use from the creek is for stock, we have dams as well and for the garden. And that's about all we use it for, otherwise we are rainwater, which is ours. We've spent a lot of money for the massive storage tanks."
>
> Participant 2: "[But] we're going to be on our way to charging for rainwater."
>
> Participant 1: "Come put a tax on all my bloody rainwater?"
>
> Participant 2: "Well that's what I mean about the injustice of some of this; it's a right of ours to collect our water."
> Mudgee Farmers Focus Group

The notion of an injustice at the heart of contemporary planning and water allocation processes – and thereby the continuing salience of the values of equity, commonness and fairness – fundamentally shapes the ways in which publics interpret and respond to communication initiatives around alternative source water projects and water security more generally.

The Politics of Scarcity

Across our focus groups, participants voiced concerns about water infrastructure initiatives. Reflecting on the controversies that surrounded the construction of desalination and potable reuse initiatives, many participants felt that messages concerning water scarcity had been manufactured to support predetermined outcomes. Take for example the following discussion among participants in the Fitzroy focus group:

> "I remember at the time they – and I'm being cynical – but in the interests of their pre-planned notion that they were going to put a desal plant in, it was just they truly created this water panic. There were press releases from the water companies about having to truck water into towns that were getting mud through their taps and it was pretty full on. I work in government and I know we can saturate the media with media releases. And it was really easy to do … you can create a panic in the community and the alternatives never got an airing."
>
> "So this desal plant … we were being misled."
> Fitzroy Focus Group, Melbourne

As a consequence of this perception and the belief that decision-making processes had been inadequate, across our groups, participants consistently questioned the veracity of water scarcity messages issued by water utilities and public institutions. Take for example the following assertions:

> "And then I think of course we need to find out where the more usage is. Of course it is not in our homes, it is in industries and mining [who] use a lot of water, and they should be bearing the cost of all this infrastructure."
> Penrith Focus Group, Sydney

> "There's no real threat of running out of water."
> Eastern Suburbs Focus Group, Sydney

> "It's just I think they're addressing a problem that just does not exist, honestly."
> St Albans Focus Group, Melbourne

> "So how I can tell who's telling me the truth with some of this?"
> Mudgee Farmers Focus Group

> "We're guinea pigs."
> Mudgee Environmentalists Focus Group

Contrary to recent research that suggests that "messages emphasising the real problem of water scarcity … will have a higher likelihood of positively impacting acceptance" (Dolnicar and Hurlimann 2011, 941), what we see in our research is a more complex picture. In discussions of the controversies that surrounded the construction of desalination initiatives, participants interpreted messages concerning water scarcity – and the need for alternative water sources – as a strategic institutional discourse. These responses drew upon a broader experiential context in which people perceived that water planning processes had not adequately considered alternative options and public values. This disjuncture between institutional strategies designed to build awareness of scarcity issues and more critical and sceptical public responses are indicative of the ways in which the notions of fairness and equity speak to cultural values of associated with water and the everyday felt experience of water planning processes. That these values were perceived as being absent from current institutional practice appears to be critical in shaping public responses to recycled water.[12]

Recent research has highlighted the importance of geographical location and broader environmental conditions in influencing public understandings of water security, and the need for new and alternative water supplies (Gilbertson*, et al.* 2011). These studies have demonstrated that context is significant in shaping public responses, and have highlighted how notions of fairness are important in the ways that members of the public interpret water conservation initiatives (Fielding*, et al.* 2010). Our research points toward a further complexity: people's experience of water planning – and particularly the perception that infrastructure decisions have been made without adequate public consultation – influences the ways in which members of the public interpret institutional messages.

As we will outline below, this underscores the importance of designing reflexive and deliberative engagement processes that integrate lay expertise and experience in making sense of media and institutional discourses. In place of a 'public acceptance model' – that tends to depict expressions of public concern as a product of a deficit of understanding and centres on motivating acceptance of technological systems – we argue that engagement processes need to be constructed in a more open fashion, seeking to encourage public participation in *both* understanding the nature of the problem *and* generating possible responses.

Water Democracy?

It was also notable that the focus group participants argued that water planning should be considered a democratic issue, arguing in favour of public consultation and involvement in decision-making processes, alongside interventions that were perceived as empowering for individual water users:

> "I mean everyone should have the opportunity [to be consulted]. …. Everyone should be able to put in their opinion should they choose."
> Perth Focus Group

> "May I also add that I think the opinion of people like us sitting at this table counts."
> Rouse Hill Focus Group, Sydney

[12] See also: Ooi, *et al.* (2014d).

A participant in the Adelaide Hills focus group poignantly captured something of the disconnect between the 'pipes and pumps' approach to water supply issues and public understandings of the role of water in everyday life. He captured much of the sentiment of our focus groups by reframing the ways water scarcity issues have been presented hitherto.[13] Questioning the role of technology in everyday life, he argued in favour a notion of discernment, characterised by an openness regarding possible options and an ethic of empowerment:

> "There's a word that keeps popping up for me as I'm listening and that is the word discernment. And I think in this kind of a jungle of opinions, we've got to sift out what we want to devote ourselves to, is something worthwhile or not, is the technology something that masters me or can I control it, you know?"
> Adelaide Hills Focus Group

Chapter Summary

In this chapter we have outlined findings from our focus group research that demonstrate the ways in which members of the public think about and relate to water.

In this chapter we have seen that:

1. People's relationship with water is shaped by a range of cultural and symbolic meanings.

2. Water is strongly associated with a series of shared values, particularly those of fairness and community. Water is understood to be a shared resource that needs to be allocated equitably.

3. For members of the public, the perceived absence of these values from contemporary planning processes serves to call into question the implied interests that underpin institutional practices and priorities.

4. These concerns influence how people respond to institutional communication practices, leading participants to question the veracity of messages around water scarcity and crises.

5. Our focus group research suggests that, for members of the public, messages concerning water scarcity are interpreted as a tactic designed to provide legitimacy for new infrastructure developments.

6. In place of public consultation processes that appear to prefigure possible technological responses, participants expressed a desire for greater levels of consultation, citizen participation and empowerment in water planning processes.

[13] We address these issues further in the Community Engagement Guidelines that accompany this report.

Chapter 4: Public Responses to Potable Reuse

When our focus groups turned to discuss potable reuse in detail, we found that the water idioms we explore in the previous chapter operated as an important frame for the collective consideration of recycled water. These idioms operated as cultural resources for making sense of the social meanings of potable reuse, and were also mobilised strategically to express concerns about the possible use of recycled water for drinking. In her analysis of environmental controversies, the sociologist Noortje Marres (2007) makes a similar observation, arguing that such 'socio-ontological associations' – or what we have termed public water idioms – 'mediate actors' involvement in the issues at stake' (p. 776). When publics understand that such associations are endangered or absent from planning processes and community engagement and consultation initiatives, these commonplace idioms may then be mobilised as a way of both expressing concern and repositioning public debate around alternative 'starting points'.

A disjuncture between the ways that potable reuse is presented institutionally and the cultural values that members of the public consider should guide decision-making was, therefore, a notable aspect of the focus groups. Throughout the discussions our focus groups' participants mobilised the notion of shared, but unrecognised, values around water allocation and distribution – precisely because they were felt to be absent from the existing policy considerations of the feasibility of potable reuse initiatives. Discussions of potable reuse moved quickly from issues of safety and feasibility to questions concerning the 'morality of water', whether water recycling would move us in the 'right direction' and notions of personal responsibility and attachment to water. In addition, concerns that were expressed tended to focus on the economic and political interests that participants perceived would be central to the introduction of potable reuse schemes. As we will argue below, one implication of this research is that the introduction of recycled water schemes without adequate community engagement and consultation seems likely to intensify existing public concerns regarding water management and allocation. Unless handled sensitively, this will contribute to the further erosion of trust in, and credibility of, public institutions (Green*, et al.* 2010; Ormerod and Scott 2012; Price*, et al.* 2012).

Dynamic Understandings

One feature of our focus groups was the dynamic nature of public responses to potable reuse and the ways in which participants' perspectives on recycled water shifted throughout the focus group discussion. There were some participants who expressed interest and support for the proposition that existing drinking supplies might be augmented with treated wastewater:

> "We've created a world where if they're going to find an answer that's probably where it is, it's in that technology somewhere."
> Mudgee Environmentalist Focus Group

> "Well, I think it's a good idea. I think there's no reason why we shouldn't supplement our existing supply, it's only going to boost us in the future and who knows what the future will bring. But, from what I've read about how it's filtered and it does go through the ultraviolet and there's micro and ultrafiltration, the extracting of heavy metals and different things like that, it's quite a long process to get the water from A to B, basically, so I think it's perfectly reasonable to think that it's drinkable."
> Mudgee Farmers Focus Group

> "This sounds probably really wrong, but I'm not worried at all. Like the technology these days, it's only going to get better, which improves everything."
> Eastern Suburbs Focus Group, Sydney

> "So it's to keep topping up that table to keep the salinity down. So that's a positive benefit obviously as well as the long-term benefit of having that water recycled."
> Perth Focus Group

> "If it comes out as recycled water, the other's recycled water, I don't feel I'd have an issue with it. I mean, they're both recycled water. One's going through, like you explained, the environment and things like that but, yeah, it's recycled, they're both recycled."
> Surfers Paradise Focus Group, Queensland

Though these participants appeared to respond positively to the technologies of water treatment and recycling, these responses were also conditioned by a range of social, economic and environmental factors. Take for example the following discussion from the Fitzroy focus group:

> Participant 1: "I don't have a problem with it. I'd drink it."
>
> Participant 2: "I sort of feel the opposite, actually. I think the more I look into it, it's just that I can understand making a positive contribution to the environment but I'm still trying to pull my head around actually drinking it …. But then, on the other side, there's that cost factor, introducing a separate infrastructure that's plugged into our homes is going to impact like another desal."
> Fitzroy Focus Group, Melbourne

While expressing a positive response to water recycling in general, the second participant here remains concerned about the use of treated wastewater in drinking supplies. For Participant 2 this reluctance around potable reuse is not simply based on an innate or psychological barrier. Rather, what we see in this interaction is the ways in which responses to potable reuse are influenced by broader concerns about costs and the environmental sustainability of water recycling.

For those who had more reservations about the use of recycled water for drinking, these wider factors were also a significant influence. Discussion across the focus groups concentrated on issues such as contamination and our relationship with bodily wastes, the unintended consequences of potable reuse, oversight and regulation and broader questions about political priorities. Participants also queried the additional treatment that would be necessary to use recycled water for drinking purposes:

> "I think from natural sources like rain and sea it would be fine but actually reusing it from other people's use, personal use, if I knew that I wouldn't drink it."
> Fitzroy Focus Group, Melbourne
>
> "The proof would be in the tasting for me. If it tasted okay, I'd drink it, if it didn't, I wouldn't, so it's hard to make a decision based on just what you're discussing at the moment. I'd need to taste it. If it tasted metallic, I wouldn't drink it."
> Surfers Paradise Focus Group, Queensland
>
> "When I walked in last week I was, like, gross, disgusting, never. So we might have all those guidelines. But you don't know."
> Penrith Focus Group, Sydney
>
> "We're doing it under the guise of we're saving the environment by recycling water. What we're doing is we're speeding it up. And if any politician wants to sign off and say, "Yes, let's recycle water" they basically are only worried about getting elected next election term. Because long term – and I go back to this analogy quite often, 30 or 40 years ago, drug companies said that thalidomide was really, really safe. Do I need to say anymore? You and I are probably not going to be here in 50 or 100 years. Alright. But our kids will be. And they may well rue the day that we said, 'Yes, let's recycle water.'"
> St Albans Focus Group, Melbourne
>
> "Technology is fantastic, but I think that the claims that are made are sometimes a little bit there to sell the product rather than tell you what you really need to do."
> Adelaide Hills Focus Groups
>
> "What are the priorities? Right here we're stuffing around with people's emotions. Oh I'm not drinking that shit! I've got to use the word because we're scared of it. But is it even necessary if we budget and design our approach to consumption properly?"
> Adelaide Hills Focus Group

From our research, it is clear that participants had both positive and negative reactions to potable reuse, but across our focus groups there was no clear trend. During the focus group discussions it appeared that perceptions of potable reuse were dynamic. Many participants spoke *both* positively *and* negatively about recycled water, and these responses appeared to be shaped by the contexts in which potable reuse would be deployed in everyday life.

What this suggests is that participants were not easily characterised as either acceptors or non-acceptors of potable reuse. Rather, our focus group participants consistently steered the discussion away from questions concerned with the risks and safety of potable reuse toward questions around the need to treat all water to drinking standards and wider governance and regulatory contexts.

The Substance of (Recycled) Water

As we outline above, in our focus groups we employed a visual research method in which participants were asked to draw a thematic depiction of an 'ideal water future' and to reflect on how they felt about recycled water, and represent this image graphically. These pictures provide a representation of the complex web of cultural and symbolic meanings that shape everyday understandings of water and responses to potable reuse. There were four distinct visual themes in the participants' pictures, while potable reuse was distinctly absent from many of the representations of idealised water futures.

The Naturalness of Water

The first theme evident in these depictions concerned the life giving qualities and preciousness of water. Take for example the following pictures:

Fitzroy Focus Group, Melbourne

These images are redolent with notions of the preciousness and purity of water and associations with rainfall, growth and regeneration. Water is also connected with bodily ingestion – either directly or embodied in plants and vegetables. What we see in these images are the symbolic meanings that are tied up with the substance of water itself, and the seeming incongruity between these common sense meanings and proposals for the advanced treatment of wastewater.

Eastern Suburbs Focus Group, Sydney

Rouse Hill Focus Group, Sydney

In subsequent discussion, participants suggested that these pictures depict an aspirational set of values – how they *want* to think about water – and as such, represented an idealised image of water:

> "We were just – we were saying that it's nice to drink from a waterfall and that we hope that in 20 years you'll still be able to drink from a waterfall. And, yes, pristine, pure, precious were some words that we also used."
> Eastern Suburbs Focus Group, Sydney

> "The only thing I can kind of draw is this childlike kind of health, flower thing and I thought, well, it needs water and it needs the sun and we need it, too, so it's all connected but really it's this - that's the main connecting factor to everything. …. [Water is] a real leveller."
> Fitzroy Focus Group, Melbourne

Here we see that water symbolises images of childhood, innocence and purity and embodies aspirations for direct and unmediated contact with the natural world.

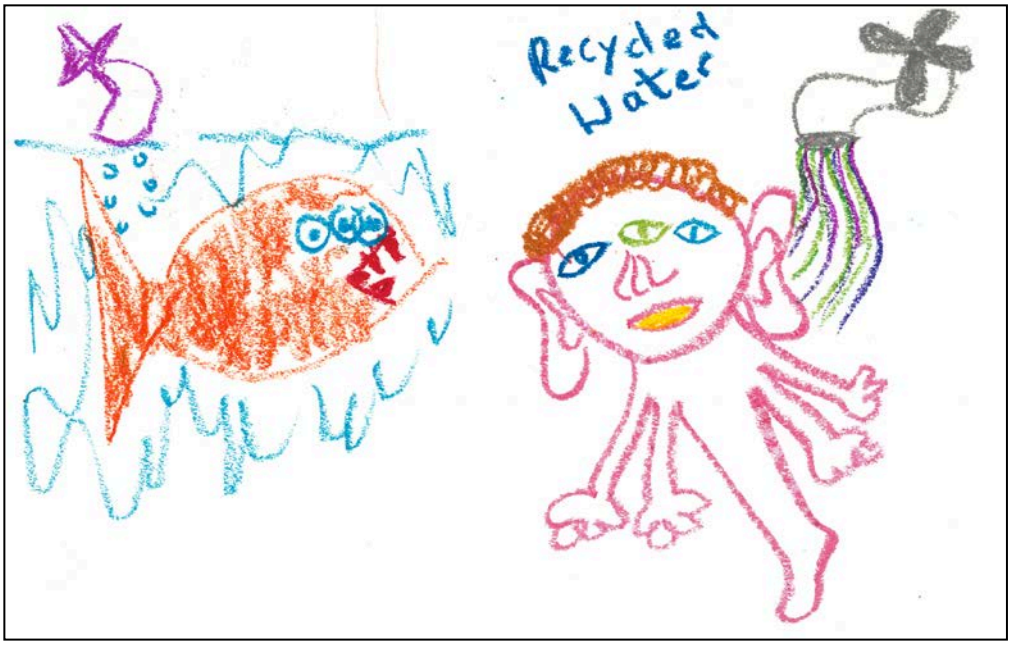
Viewed historically, these images of water as an innately pure substance evoke a notion of naturalness that stands in contrast to the urban settings of everyday water consumption and the infrastructures of modern water provision. These images might therefore be viewed in the context of artistic depictions of the Australian landscape which have been characterised by a contrast between images of a wild and external nature and pictures of the domestic spaces of everyday life, urban and agricultural landscapes (Bonyhady and Griffiths 2002; Trigger and Griffiths 2003). The participants' idealised imagery of water is both sublime and picturesque – with depictions of waterfalls, sunshine, gardens and smiling faces. It is notable that in these childlike and elegiac scenes the infrastructures of water provision are conspicuously absent. The counterpoint between the natural and the unnatural – which in the images is presented as a contrast between the pure and the impure – therefore appears to provide an interpretive template for understanding the meaning of water and a cultural register in which recycled water is situated.

These images also embody a series of values and aspirations. They are indicative of how participants *aspire* to think about water, rather than being realistic portrayals of everyday water use. The values of commonness – that water is a 'real leveller' – operate as a normative claim about how water *should* be managed. The absence of water recycling in these images is therefore indicative of the disjuncture between commonplace norms of water and the presentation of potable reuse as a highly technologised form of water provision. In subsequent discussion, when we questioned how potable reuse and recycling more generally might relate to these elegiac images, participants responded by suggesting that:

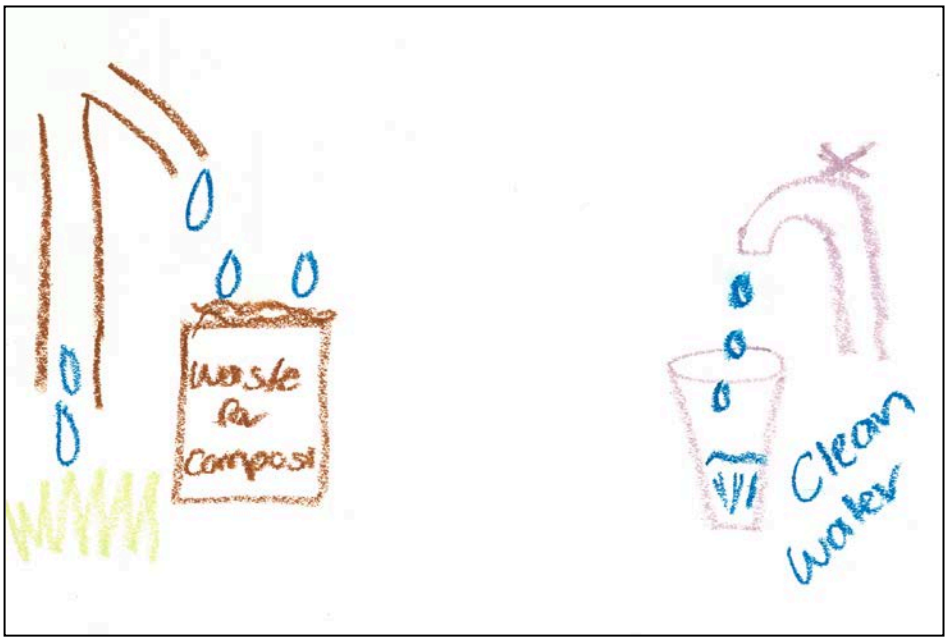
> "Well, it (potable reuse) is not really there because we don't need it."
> Rouse Hill Focus Group, Sydney

Recycled Water as Transgressive

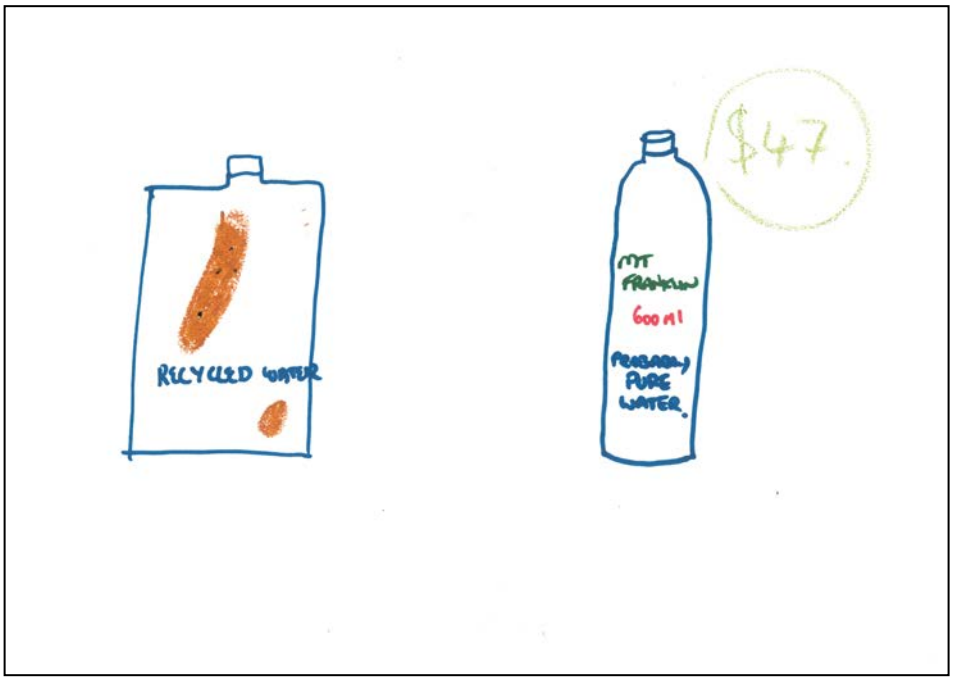
A second and related theme evident in these pictures concerned the transgressive potential of recycled water, and the need to maintain a separation between treated wastewater and domestic water. Take for example the following images:



Eastern Suburbs Focus Group, Sydney



Rouse Hill Focus Group, Sydney



St Albans Focus Group, Melbourne

In these pictures, what we see is the way in which recycled water is intimately tied to depictions of waste, excrement and pollution. In a brief discussion of the cultural meanings of water – and relevance for these associations for understating public responses to water recycling – Strang (2006) notes that "water is never 'just H_20': it carries a range of powerful meanings, and these recur (in culturally specific forms) in every society" (p. 6). Strang goes on to argue that it is these cultural meanings – and particularly the association of water with life, (re)birth, washing and the human body – that are critical to public concerns about drinking treated wastewater. Water that has been ingested by other people, or that is regarded as dirty, Strang argues, is perceived as being "polluted by 'otherness'". The acceptance of recycled water, she argues, "requires us to feel confident that the treatment process has been successful in removing that 'otherness', and in rehabilitating the water so that it is transformed from 'dead matter' back into 'life giving substance'" (p. 6).

What we see in the above pictures is the potential recycled water represents for blurring the boundary between clean and dirty water, and the possible unintended consequences of potable reuse schemes. The participants explained the images in the following terms:

> "We're representing people that are scared about what might happen if they drink recycled water; what will happen to people and the environment. So you've got fish with three eyes and then obviously a person who has four arms and one foot, three eyes."
> Eastern Suburbs Focus Group, Sydney

> Participant 1: "It's going to happen. There's no doubt that it's going to happen."

> Participant 2: "At first it might be all good and great. But eventually in the years to come when they start slacking off ... they're going to lose quality. And eventually particles will start slipping through."
> St Albans Focus Group Melbourne

Anthropological accounts of waste, pollution and taboo have also highlighted the deeply engrained cultural rituals engaged in maintaining a demarcation between clean and dirty substances and the sense of transgression when these boundaries are perceived to have been crossed. In her landmark account of the cultural meanings of purity and pollution, the British anthropologist Mary Douglas (1966), who famously defined dirt as 'matter out of place' (p. 44), explored the complex array of social and cultural practice designed to ensure that potentially transgressive substances – blood, excrement and other bodily fluids – remain in their proper place. In domestic settings, Head (2008) notes that "water is purified to become 'good' nature before it enters the house, and once it becomes 'bad' nature, in the form of sewage, it must not only be removed, but be visually excluded" (p. 70). It is evident in the images drawn by the participants that recycled water transgresses the cultural structures that separate 'good' water from 'bad' water. In the series of pictures we include above, where recycling systems appear to be present, they are depicted outside domestic settings. Explaining these depictions participants argued for a clear separation between domestic and non-domestic uses of recycled water:

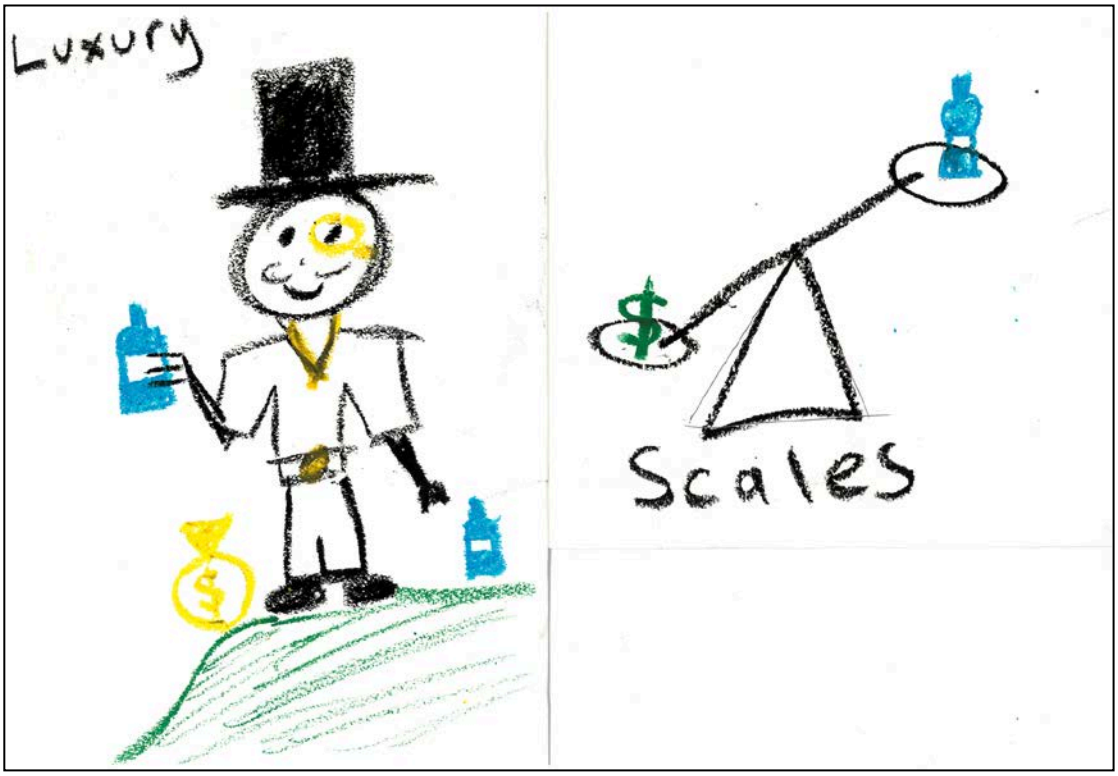
> "We want to be able to turn the tap on and be able to drink it. …. Recycled water, you can use it for the grass and stuff, hopefully for carrots but we don't know yet and the rest of the waste for compost, recycling as much as possible."
> Rouse Hill Focus Group, Sydney

Though much of the public commentary around potable reuse has been characterised by discussions of the possible psychological barriers to public acceptance – and particularly issues such as the 'yuck factor' and notions that drinking treated wastewater is an inherent cause for disgust (Dolnicar and Hurlimann 2009) – what is evident in these pictures, and in the participants' explanation of them, is a more complex set of cultural meanings that shape notions of transgression (Ooi*, et al.* 2014b). While public concern about recycled water has often been presented as a product of ingrained cultural norms, and the sense that drinking wastewater might be considered a "violation of the natural order" and thereby "unnatural" (Alexander*, et al.* 2008, p. 13), in the comments above it is clear that concerns about the domestic consumption of recycled water might be more properly understood as a way of negotiating the social and cultural structures designed to separate the clean from the dirty. For the participants quoted above, recycled water does not appear to be innately troubling. Rather it is that recycled water may transgress an important symbolic and literal boundary – between self and other, between clean and dirty and between inside and outside the house – and that systems of regulation and governance may prove inadequate.

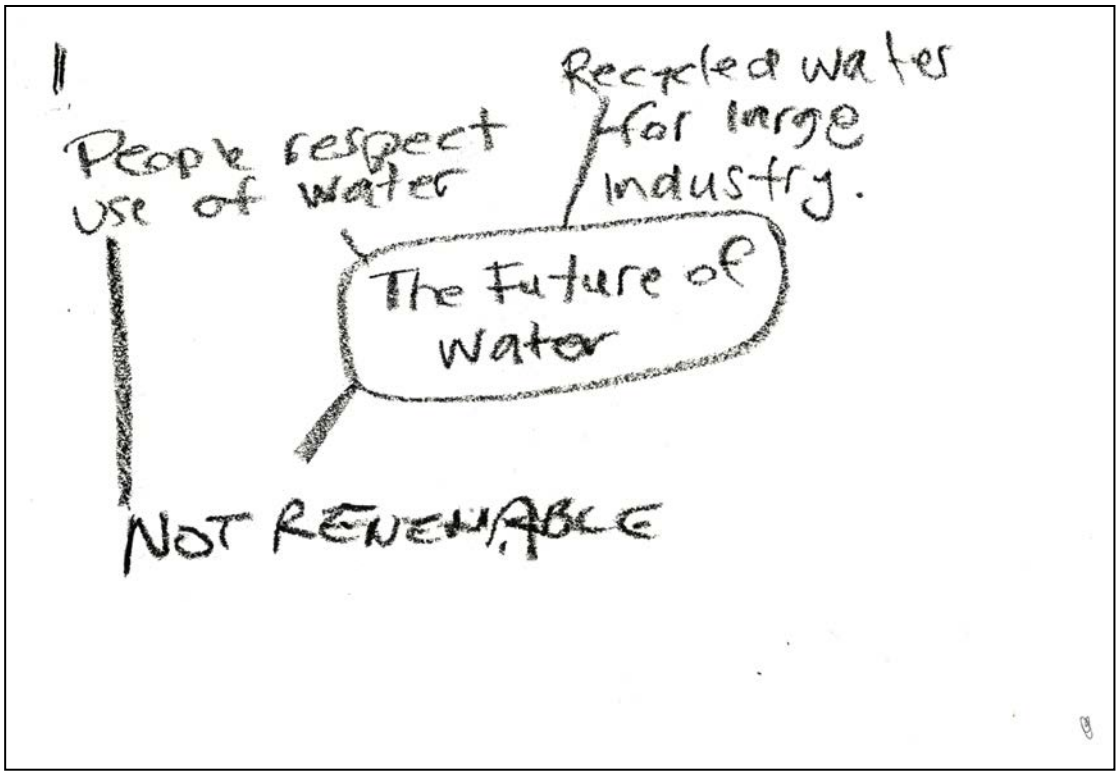
Though notions of the naturalness of water were an important theme in our focus group discussions, it was not apparent that recycled water was viewed as inherently unnatural. Rather, these images of water as natural appeared to speak to how participants thought water should be managed. It is for this reason that we suggest that concerns about the safety of recycled water did not appear to be based primarily on innate fear or visceral disgust, but were rather shaped by perceptions of the social and political factors that were likely to influence the everyday experience of recycled water.

The Politics of Water Recycling

The third theme evident in participants' drawings spoke directly to this more explicitly political theme. See for example the following two pictures:



Gold Coast Focus Group, Queensland



Mudgee Environmentalists Focus Group

In these two pictures we see the ways in which images of profit, greed and corporate interest shape in participants' depictions of potable reuse. Participants explained these pictures in the following ways:

> "Fresh water, only the rich will be able to afford it and it will be at a luxury."
> Surfers Paradise Focus Group, Queensland

> "Recycled water [should] be used for large industry because they do use so much water."
> Mudgee Environmentalists Focus Group

A similar set of themes are also evident in images of self-reliance and images that appear to question the need for water recycling. See for example the following picture:

Mudgee Environmentalists Focus Group

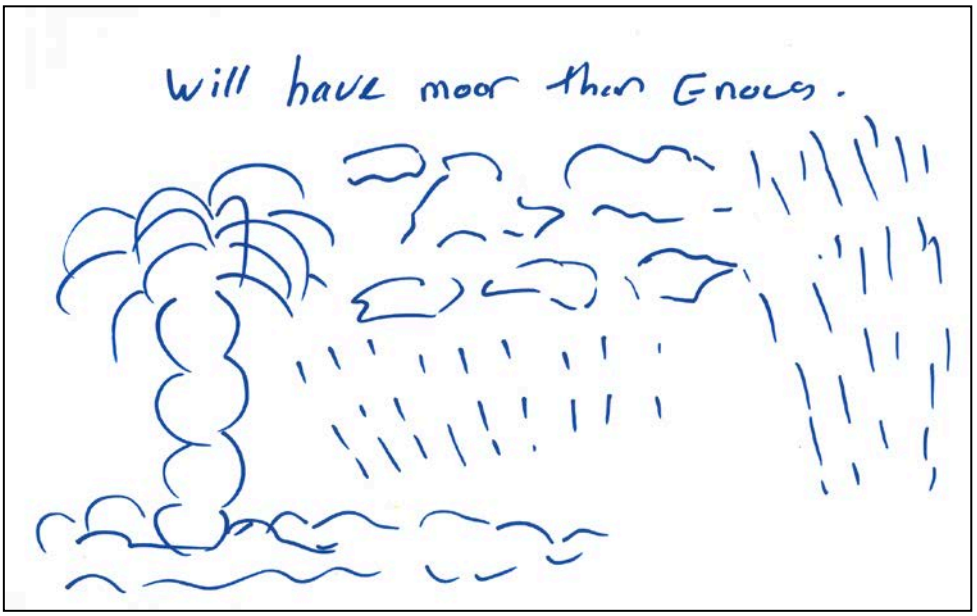
What we see in these images is that where potable reuse is depicted in participants' imagery it is represented unfavourably, while more idealised pictures of self-reliance, environmental sustainability and balance dominate the participants' imagination of water. For participants, this notion of self-reliance and the appeal of 'low-tech solutions' constituted an alternative to potable reuse. For example:

> "We sort of just had things where we envisaged sort of more low tech solutions. So we've got the rainwater harvesting, like on houses. We've got the tank, timers, like when you're having showers, things like that."
> Mudgee Environmentalists Focus Group

Evident in the participants' drawings is the scepticism that some members of the public feel for messages around water scarcity. Take for example the following picture:

The participant explained the meaning of the picture by arguing that:

> "We will always have more than enough water. The rain is always going to fall – it's never going to stop."
> Penrith Focus Group



Penrith Focus Group, Sydney

When this view was explored and debated amongst other focus group participants, a more nuanced discussion ensued with participants ranking potable reuse low on their list of priorities for water conservation:

> "[Potable reuse] would be lower on the list. Absolutely; rainwater tanks, recycled water for gardens and all that, and even bathrooms, showering. But not necessarily for cooking and drinking."
> Penrith Focus Group

Discernment and Priorities

Throughout our focus groups, a significant area of discussion concerned the need to recycle water for drinking purposes – and the relative merits of both domestic and non-domestic uses of treated water. These discussions focused on whether potable reuse schemes should constitute a policy priority for public investment, in light of both technical alternatives and other demand management strategies.

Questions of Need

When asked whether they would 'accept recycled water' the participants in our focus groups consistently attempted to reframe the discussion, instead focusing on a range of broader considerations. For example, some participants questioned whether there was a need to diversify water supplies and in fact whether scarcity constituted a long-term problem:

> "I just think they should be able to channel it somewhere where it's really required…. It's not really required because we've got enough water here. I know it's going to cost a lot of money for pipelines but I just thought that focus might be better, to get water out to them."
> Mudgee Environmentalists Focus Group

> "Well, I believe that there is enough water in Australia. Some areas are flooding and other areas are dry. I think it's more just moving it in the correct direction, because we've got plenty of water."
> Eastern Suburbs Focus Group, Sydney

At the same time participants questioned institutional communication and consultation strategies, and appeared sceptical of the role of water authorities and governments in mediating public understanding of water supply issues. As we note above, these concerns were indicative of a common understanding that the issues of water scarcity have been politically and institutionally manipulated to support pre-determined technological outcomes. When we turned to discussing water recycling, many of the participants were concerned that political considerations and commercial imperatives would unduly influence water planning and decision-making processes around potable reuse.

Take for example the following comments:

> "I think they first need to work on the political issues because there's a lot of issues right around the river, because it has always been said that we have enough water but it is the politics of the river that actually stops them send[ing] it to the right areas. So there's a lot of political issues. They need to sort out the issues at that end because we have enough water."
> Penrith Focus Group, Sydney

> "I've never seen anywhere either the company or the government announcing, 'Hey, guys, we've got excess water, we're going to reduce your bills or please use more.'"
> St Albans Focus Group, Melbourne

> "The trick is to tell you we're short on something and we must use this technology, possibly, to increase the supply. That just happens to be a really neat business model. Be suspicious a little bit about the intentions."
> Adelaide Hills Focus Group

> "It could be a money ploy, it's a business. It's something that makes somebody at the top of the food chain money. It's a harder sell. I don't think anyone would choose to drink recycled water."
> Surfers Paradise Focus Group, Queensland

What is evident in these discussions is a call for richer forms of discernment, that extend current policy considerations of water supply issues beyond the 'pipes and pumps' approach that has characterised Australian water planning to date. As we outline below, one implication of these discussions is the need to move beyond the rather limited framing of community consultation as a mechanism to generate public acceptance towards models that embrace deliberative decision making (Mackenzie 2008; Syme and Hatfield-Dodds 2007). The Community Engagement guidelines that accompany this report provide guidance on developing long-term forms of public participation in water planning processes in ways that enable the broad community consensus on the need to consider alternative water sources.

The Relative Merits of Potable Reuse

In the context of these concerns, a striking feature of our focus groups was the relative disjuncture between relatively positive responses to water recycling in general and the more ambivalent responses to the proposed development of potable reuse schemes. Water recycling and conservation were generally viewed positively:

> "For non-drinking uses, it's just a no-brainer in Australia."
> Eastern Suburbs Focus Group, Sydney

> "It improves the water quality at Bondi Beach through being filtered. They use that water as well for the local area, they use it for better quality of the recycled water for the parks and things like that."
> Eastern Suburbs Focus Group, Sydney

> "I think if you can reuse it, why not… I think in Australia, especially with all the droughts, and here we have such huge space of desert basically in the middle, I feel it's a must in a way."
> Fitzroy Focus Group, Melbourne

In contrast to these generally positive responses, across all our focus groups participants questioned the need to move toward water recycling for drinking water. In place of the notion that water recycling is a 'no-brainer' participants described potable reuse as 'silly', 'extravagant', a 'last resort" and a 'band-aid'. Take for example:

> "Because there comes a point where you're being really silly. If we've got a choice you can say, 'Are we really short of water or is there another agenda?'"
> Adelaide Hills Focus Groups

> "Personally I think that drinking sewage water should be the last resort."
> Rouse Hill Focus Group

> "I think it's horses for courses where you need to do it. But I think it's got to be a bit of a last resort."
> Mudgee Farmers Focus Group

> "I don't have a really strong opinion about this as such, but to me it sounds like, the recycling, the sewerage water is kind of like a band-aid. Like, I'm a bit with you. We're going to face bigger issues… in the coming time if we don't actually go to the root of the problem and try to find the natural ways to do it."
> Rouse Hill Focus Group

The relative merits of potable reuse, as distinct from water recycling for non-domestic purposes, was a common theme throughout our focus group discussions. Participants questioned whether all water would need to – or indeed should – be treated up to drinking standards, whether recycled water might be used solely for non-domestic uses, and whether segregated supplies of recycled water and traditional water supplies might be made a standard feature of new urban developments.

What is striking here is that, while participants appear to accept that potable reuse may constitute one response to water scarcity and supply issues, there was a common perception that treating wastewater up to the standards necessary for drinking was both costly and wasteful. Take for example the following discussion drawn from the Adelaide Hills focus group, which expresses something of this sentiment:

> "Adelaide only drinks 2 million litres of water a day, the rest is something else. The idea of having to process poo back up to those 2 million litres is really silly."

> "The idea of processing everything back up to that standard is just silly, waste of energy, waste of capital. If you got society organised in a different way, and you might say, 'Well yes, but we can afford it, why not?' Well that's silly too."

> "I think deep recycling is sort of an extravagance in a well organised system and therefore why take the expenditure and the risks?"
> Adelaide Hills Focus Group

In this context, the energy requirements of potable reuse schemes, and broader questions of environmental sustainability and waste disposal, were also an area of significant discussion. When comparing indirect potable reuse methods with direct potable reuse initiatives, proposals with a clear environmental buffer were generally viewed more favourably. However, there remained significant questions about the need for potable reuse in general and the energy consumption and costs associated with water recycling for drinking purposes:

> "It's a lot more expensive to recycle water. Apparently it can be fairly bad for the environment because of the energy needed and the fossil fuels. …. So it's an expensive process, so don't think it will be the cheap way out. I think it will be more expensive."
> Surfers Paradise Focus Group, Queensland

Navigating Recycled Water

As we outline above, one of the key ways in which potable reuse has been presented in both policy literatures and media coverage is through a notion of inevitability – that the combined trajectories of environmental, social and demographic change will make it necessary to consider alternative water supply options, and water recycling in particular. As we worked though the focus groups, this concept of the long-term unavoidability of potable reuse became an area of significant discussion and debate. Many participants seemed to agree with the general proposition that water recycling would need to be more fully considered in the future in light of the pressures on existing supplies:

> "I think it's inevitable that we'll be drinking recycled water, and like somebody else said, that when we have a crisis, then that's when it will bring it home. …. So I think it's just a matter of time."
> Eastern Suburbs Focus Group, Sydney

> "I kind of feel like it's inevitable; that's how I feel, and it has to happen."

Perth Focus Group

For many participants, the introduction of water recycling initiatives was seen as simply a 'matter of time'. However, it was also clear that, although participants thought that potable reuse might be inevitable, or at least highly likely, this did not translate into unqualified support or acceptance of the need to develop water recycling initiatives.

Water Recycling for 'Other People'

A notable feature of the focus group discussions was the ways in which participants thought that potable reuse would happen irrespective of concerns about the safety of water recycling and broader questions of the need for the domestic consumption of recycled water. Take, for example, the following comments:

> "If you had potty water and bottled water; I'd drink the bottled water. [But] with my children in the future they've probably got no choice. … I agree for them to do it in the future if it's needed. But the thing is, if it's not needed, it doesn't make sense. Why are we doing it? Because we're just wasting precious time doing it for no reason. However, the past has proven to us that we might need to do it. …. So I can see the point of it. However, I wouldn't drink it. I would definitely buy bottled water. [But] for my children I would make them drink it because then they have to live with that type of water for the rest of their lives. But I wouldn't."
> Penrith Focus Group, Sydney

> "I agree with a 10 years trial within the Perth area. …. Let them be the guinea pigs."
> Penrith Focus Group, Sydney

> Participant 1: "I would still purchase the water that I'm buying now, the normal bottled water. Even if they were side by side on the shelf, I would still purchase the bottled one, however, I don't think it's terrible or anything like that. I think at one point, in probably not my generation but in times to come, they will be drinking it."
>
> Participant 2: "They might have no choice."
> Rouse Hill Focus Group, Sydney

In these discussions, although potable reuse is presented as inevitable, it is also regarded as an issue for other people – for future generations and for other locations. While participants felt that the domestic consumption of recycled water was likely to happen, in these discussions the notion that potable reuse would be inevitable seemed to confirm – rather than assuage – participants' broader concerns about the social, economic and political factors they perceived were likely to shape the future management of water. The development of water recycling schemes was seen not simply as a response to changing environmental conditions and the need to secure water supplies, but as a consequence of economic pressures and commercial imperatives. Take, for example, the following discussion in which a participant compares bottled water with recycled water:

> "It's going to happen… Water is becoming a commodity … and someone has got the notion that they can get in on the ground floor and start making a bucket load of money out of it. I can see even in the near future that you go to the shops and instead of paying $8 for 24 bottles of Coles water it's $45 for 24 bottles."
> St Albans Focus Group, Sydney

At the same time, the sense that potable reuse is inevitable was also tied to the feeling that water recycling was an option of 'last resort', an extravagant response precipitated by entrenched patterns in existing water management:

> "But, again, don't make the decision because it's the last resort… Of course, it's the worst case scenario."
> St Albans Focus Group, Melbourne

As we noted above, what we see here is indicative of the ways in which the crisis and emergency narrative has, in recent years, been reframed as an issue of political mismanagement and intransigence. This suggests that, while public engagement and communication initiatives need to make a strong case for the need for water recycling, and for the domestic consumption of recycled water, public responses to

messages around water scarcity are likely to be shaped by the economic, political and social interests that are perceived as central to contemporary water management. Messages that emphasise the inevitability of potable reuse are, we argue, likely to intensify existing perceptions that decision-making processes have been badly handled, have lacked adequate public input and have been influenced by commercial and political factors.

Trust in Government and Institutions

Academic work on public responses to water recycling (Alexander*, et al.* 2008; Marks*, et al.* 2008; Ormerod and Scott 2012; Price*, et al.* 2012) – and the broader literature on public understandings of science and technology (Kearnes and Wynne 2007; Macnaghten*, et al.* 2005) – have also tended to suggest that assessments of the trustworthiness of public bodies and private companies are critical in shaping public perceptions of new technologies.

Work in the 'sociology of trust' has distinguished between two forms of trust: "facework commitments" and "faceless commitments". Facework commitment is based in what Giddens (1990) characterises as "social connections established in circumstances of copresence" (p. 80) and, as such, is characteristic of traditional societies. In this context, faith and trust are expressed relationally, in people and social structures that are immediately connected to everyday experiences. In contrast, the kinds of faceless commitments that typify modern industrialised societies require faith in 'abstract systems': expert knowledge, technological systems and financial exchange.

One implication of these analyses is that, as relations of trust have become more abstract, members of the public have adopted a more sceptical and questioning attitude toward claims of institutional authority (Beck 1992). In our focus groups, this more reflexive attitude was evident in the way participants expressed concern about the trustworthiness of institutional communication initiatives and the adequacy of regulatory structures:

> "I think the economy [is a] part of it and the governments are now trying to cut as much as possible. Shortcuts basically. This is not only for water, for everything. If they can outsource it or if they can say: 'It's not my problem, it's somebody else's problem' they will do it."
> Rouse Hill Focus Group, Sydney

> Participant 1: "My other concern is that once they do this and it's in … and they do come across problems with it and because they've spent so much money on it…"

> Participant 2: "They won't tell you the whole story… That's why it brings me back to how do they know it's safe … How do I actually physically see that it is safe? They will cover it up. They will protect themselves but they will cover it up."
> St Albans Focus Group, Melbourne

As we have suggested above, while our participants regarded water recycling as something that 'would happen' this perception functioned to intensify concerns about the unacknowledged political and economic commitments that were felt would influence institutional practice and the adequacy of regulatory oversight.

Choice and Personal Preference

One implication of this more reflexive and questioning attitude toward institutional claims to expertise and authority is the expectation that consumers will have a more tailored and individualised relationship with products and public services. Recent work on everyday consumption patterns has demonstrated the ways in which modern consumers "actively construct a meaningful, viable and coherent sense of self-identity through reflexive choice" (Beckett and Nayak 2008, p. 302), while consumer research in the water industry has identified significant segments in the Australian public that increasingly expect that service provision will be tailored to their personal values and attitudes (Jenkins and Storey 2012; Ooi*, et al.* 2014c). Accordingly, issues of choice, personal control and responsibility were an important way in which participants considered recycled water in our focus group discussions. Many of the participants were concerned that they would not have a choice in whether to accept recycled water, while other participants were insistent that they should have a choice in whether to accept recycled water:

> "We have that fear they will do it and then we won't have any choice in it."

St Albans Focus Group, Melbourne

"I think sooner or later we'll have to, there'll be no choice."
Surfers Paradise Focus Group, Queensland

"But if I'm buying it I want to have a choice, and there will be no choice."
Perth Focus Group

"If you chose to have – or wanted recycled water rather than using the normal water – you could get recycled water delivered as a choice and have a tank."
Fitzroy Focus Group, Melbourne

In these discussions, participants were working across multiple – and at times contradictory – identities. In the quotations above we see notions of consumer preference and choice, while at the same time participants spoke with a citizen identity underpinned by the idioms of common-ness and fairness. Alongside this we also noted a more pragmatic acceptance of the technical difficulties entailed in delivering alternative forms of water to domestic settings and participants spoke of the need for equity in water distribution and allocation:

"If they were to implement it how can you give somebody the choice, though? They're either - they're doing it … or they're not doing it. You don't have a choice if they start doing it. All the pipes are already set up. Can they change the pipework and send recycled sewage to people that are using it?"
Eastern Suburbs Focus Group, Sydney

"Unless you're really, really rich and can source your own sort of water for bottling and drinking what other choices are you going to do? You're not going to die of dehydration just because you're too proud."
Rouse Hill Focus Group, Sydney

"I don't think there should be choices… I think they should just pump to every house the same quality water."
Eastern Suburbs Focus Group, Sydney

These discussions indicate the ways in which notions of personal choice and self-expression – that are increasingly central to modern consumer practices – intersect uncomfortably with the common sense idioms of fairness and equity. Throughout our focus groups, participants seemed to find it difficult to resolve these conflicting norms. This is attributable to the ways in which potable reuse has been presented to the public as an issue of technological acceptance. Throughout our discussions, a recurring theme was that the introduction of water recycling schemes would be imposed upon the public rather than negotiated through more extensive forms of public participation. A participant in the St Albans group succinctly summed up this concern, asking pointedly:

"Are they going to test something on us?"
St Albans Focus Group, Melbourne

Control and Empowerment

One implication of this dynamic was evident in the way participants expressed a preference for technologies that were perceived to be personally empowering. As we have outlined above, the pictures the participants drew during the focus groups demonstrated clear preference for low-tech water technologies, typically located in domestic settings; water tanks and home-based conservation technologies. For our participants, these technologies symbolised autonomy and control and, in discussion, we explored why the participants had been drawn to these technologies rather than potable reuse. One participant in Mudgee explained her preference for a home water tank in the following terms:

"I prefer tank water only because it's free. Well I just use the tank water because it comes out of the sky."
Mudgee Environmentalist Focus Group

Similar notions of control and autonomy were evident in the discussion of home filtration technologies. A participant in the St Albans focus group explained that:

> "I think you've got more control…having that filtration system it's like that, you know, you're responsible for that filtration system. So you're going to test it regularly. You're going to change the filters on it regularly. You're going to have more of a control over that."
> St Albans Focus Group, Sydney

What we see in these discussions are the complex relations between water, the home and practices of everyday consumption. The home represents for people one of the most significant sites of personal control and responsibility (Head and Muir 2007). Controlling water in domestic settings – through rainwater collection, home filtration and conservation – is, for our participants, critical to their sense of self, and is often interwoven with notions of parental responsibility and economic autonomy. For many of our participants, going 'off-grid', and becoming self-sufficient in water provision, was seen as an aspirational goal. It was striking that personal control over water provision and water technologies was perceived as more empowering and therefore highly regarded by our focus group participants. This deeply embodied relationship with water in turn influences how people assess the trustworthiness of public bodies. A participant in the Rouse Hill focus group explained that:

> "It's your prerogative. You can fully trust every individual and then do whatever you want. It is my prerogative to research it and say: 'I don't trust that so I won't do it'."
> Rouse Hill Focus Group, Sydney

The implications of these issues of control and autonomy for water recycling are, of course, complex. The use of recycled water for non-domestic purposes was regarded by our participants as a relatively positive development. While there was some disagreement about the safety of recycled water for use in gardens, participants from suburbs with direct experience of 'purple pipe' infrastructures spoke of being able to use water more freely during periods of water restrictions.

However, potable reuse was regarded quite differently. Participants consistently spoke of the likelihood that water recycling schemes would be implemented in ways that constrained their personal autonomy and choice. Potable reuse was generally regarded as disempowering and as increasing people's dependence on inflexible technological systems. Without a more immediate relational context in which to situate potable reuse, people struggle to place their trust in an abstract infrastructure of scientific expertise and technical reliability. It is for this reason that our participants adopted a relatively sceptical and questioning stance when presented with information on the safety of recycled water. Participants felt that interpreting messages about the safety of recycled water was a matter of personal judgment – or their 'prerogative'. A participant in the Perth focus group vividly summed up this sentiment by suggesting:

> "I don't know, unless you provided me with a dipstick or something I could test it before I drank it, I just wouldn't. Just to know that it was clean, so there's just that minute chance that something could not filter properly, you know, one organism that can grow in there and… no thanks!"
> Perth Focus Group

Consultation and Public Engagement

Given this range of concerns, a general consensus across all the focus groups was that issues around water recycling and water scarcity are an important area of public policy that needed more public discussion and participation. Mirroring the public water idioms we summarise above, two key themes were evident throughout the focus group discussions:

1. People felt that they had a right to be informed and consulted about the development and introduction of potable reuse schemes and believed that, to-date, public concerns had not been adequately handled.

2. There was also the suggestion that governments need to make decisions and proceed with projects and, while public participation in decision-making was important, water is something that governments and other public bodies are responsible for.

It was in this context that participants spoke of the need to not only be informed about the implementation of projects, but also to be more thoroughly consulted and engaged in the formation of projects. It was striking that participants spoke about their participation in decision-making as a democratic right:

> "So then these people need to be consulted because they want to know where their money is going to and how – and obviously they don't want to pay another $100 a week in tax."
> Rouse Hill Focus Group, Sydney

> "I don't think we're getting enough information on what exactly are they doing, what are they putting into it, what are they taking out. It's a bit unknown sort of thing."
> Surfers Paradise Focus Group, Queensland

In addition to the notion that people *should* be engaged in decision-making processes, in areas where water recycling initiatives have been initiated there was also a degree of dissatisfaction with the extent of existing consultation and engagement practices. In Perth, for example, many of the participants were surprised by the location of the existing groundwater replenishment trial and the extent of consultation and communication processes undertaken around the trial. Many of the participants in the Perth focus group suggested that they felt they had not been sufficiently consulted on the project, with one participant arguing that:

> "Actually maybe a letter in the mail was not sufficient, but everyone should be able to put in their opinion should they choose."
> Perth Focus Group

In a similar fashion in the Rouse Hill focus group – a community with an established 'purple pipe' system – there was a degree of concern about the 'mixed messages' participants had received concerning the scheme from local authorities. Some participants reported that it was difficult to find reliable information on how recycled water might be used safely.

Trusted Voices

These specific observations about engagement and communication practices in Perth and Rouse Hill were indicative of a broader set of concerns participants highlighted about the reliability of public information and the trustworthiness of sources. Throughout our focus groups, participants were savvy in their consumption of media – and adept at interpreting ideological viewpoints in major media outlets. This interpretive capacity was a significant influence on how people responded to a series of perspectives on recycled water provided during a focus group. Overly positive messages about recycled water – or the overtly negative messages of activist groups – were generally perceived to be biased and influenced by unacknowledged political and commercial commitments. Take for example the following discussion drawn from the Fitzroy focus group:

> "I mean, everyone knows that most articles … will have the person who's against it and a person's who's pro. An article in The Australian – they would probably cite Peter Collignon. And if it was The Age, they would probably go with CSIRO. …. You would probably very quickly get an idea of what the person stands for and why that person was chosen for the article."
> Fitzroy Focus Group, Melbourne

> "We naturally have bullshit meters and we're pre-disposed to different sorts of media. I'm pre-disposed to the *ABC* rather than *Today Tonight*. My parents are pre-disposed to *Today Tonight* because it's simple and they're migrants and because it's geared towards people like them… So if you've got people on things like *Q & A* and they're legitimate experts and they've been selected carefully, I think people are more likely to believe them than *The Australian* or *The Age* even."
> Fitzroy Focus Group, Melbourne

> "I tend to read *The Age* instead of *The Australian* because, politically, that's what I believe in. And obviously I've got my preconceived opinion so I'm already there… I will probably pay more attention to Dr Simon Toze or Stratton than I would to Peter Collignon because I've already got my pre-conceived opinions… So I guess even though we're looking for information and to be educated we still have some sort of preconceived opinion."

Fitzroy Focus Group, Melbourne

Intriguingly, the groups viewed information provided by authoritative organisations and public scientists relatively positively but maintained scepticism that in the 'real world' sound scientific procedures would necessarily guide practice. Discussing the perspective of a notable microbiologist, the St Albans Group captured this scepticism:

> Participant 1: "I don't have my doubts about this microbiologist. Yes, they are doing their best but the way they're preparing and doing these tests, yes, they are very strict and very cautious. But when it goes into the real world they don't take that precaution."
>
> Participant 2: "So you'll either get greedy, selfish people who will somehow skip things and we will pay the price. So, yeah, these microbiologists are doing their job. They are doing it and there's very strict conditions that they're doing it under. You're not going to get that in the real world. There's no guarantee of that."
> St Albans Focus Group, Melbourne

Chapter Summary

In this chapter, we have outlined our analysis of the ways in which people think about and make sense of water recycling.

In this chapter we have seen that:

1. People's understandings of and responses to water recycling are dynamic. People are rarely *either* acceptors or non-acceptors. While some members of the focus groups were positive about the recycled water most of the participants were ambivalent about potable reuse.[14]

2. Public responses to water recycling are shaped by a disjuncture between commonplace understandings of water, and its associations with notions of fairness, equity and common-ness, and the ways in potable reuse is presented as a largely technocratic response to water scarcity.

3. Public responses to potable reuse are therefore often highly conditional, and are influenced by a range of social, political and institutional factors including: questions concerning the need for water recycling for drinking, trust in government and public institutions, notions of choice and consumer preference and concepts of control and empowerment.

4. While members of the public recognise the need for broad public consultation regarding water recycling, there is likely to remain a significant differential between the ways potable reuse is framed in policy and media and the issues that publics consider salient in decision-making.

5. The introduction of potable reuse schemes is therefore likely to intensify existing concerns about the trustworthiness of government and perceptions of political mismanagement.

6. Community and public engagement around water recycling should therefore be designed in a more open fashion – in ways that extend beyond concerns about the 'public acceptance' of technological systems or the traditional 'pipes and pumps' approach.

7. Community engagement should be conceived as a way of opening policy processes up to diverse public input, focused primarily on the nature of the problem rather than generating acceptance for proposed solutions.

[14] See also Price, *et al.* (2010).

Chapter 5: Implications for Community Engagement and Communication Practice

This concluding chapter identifies the challenges from our research and highlights a series of implications for community engagement and communication practice. The results of the study form the basis of the Community Engagement and Media Guidelines that accompany this report.

Perhaps the most significant finding from our research is the need to rethink the purposes and intent of community engagement initiatives around water recycling. Although the focus group discussions we have explored above were, at times, ambiguous, and public responses to potable reuse dynamic and conditional, clear trends emerged throughout this research. There appeared to be a strong preference for water conservation practices over the development of potable reuse initiatives. While water recycling was viewed quite positively for non-domestic purposes, potable reuse was seen as an option of 'last resort' – with a moderate preference for 'indirect potable reuse' over 'direct potable reuse'. Our research also suggests that members of the public are relatively savvy and discerning in their interpretation of media and institutional communication strategies and readily distinguish between the provision of reliable and trusted information and strategies designed to persuade and sway public opinion.

While much of the existing social science research has identified a range of dispositional factors that shape public reactions to the idea of drinking recycled water, in our research we found that responses to water recycling were tied to notions of governance and the values of fairness, equity and common-ness. These commonplace water idioms represented for our focus groups 'common starting points' that shaped their responses to, and interpretation of, institutional communication initiatives around water recycling. In general terms, there appeared to be a disjuncture between the values that participants thought should govern the way water is managed and the ways that water recycling is framed in contemporary policy-making and media coverage. Across our focus groups, participants called for approaches that are aligned with the cultural landscape of Australia and the values of fairness and equity. They also argued for more democratic planning and decision-making processes, in ways that accommodate desires for sustainable community and individual practice. Responses to recycled water were also influenced by concepts of personal preference, choice and empowerment.

Our research suggests that the introduction of potable reuse initiatives without carefully conceived and well-designed community engagement strategies that focus on the need for alternative water sources, rather than simply whether publics accept potable reuse technologies, is likely to intensify existing perceptions of the political mismanagement of water. In the following section of this concluding chapter we identify five key challenges that our research points to.

The key challenges are:

1. Moving beyond 'public acceptance'

As we have highlighted above, 'public acceptance' is increasingly presented as critical to the success or failure of alternative water source schemes. Indeed it is now routinely claimed that the implementation of potable reuse initiatives will be dependent on both public and stakeholder support and a clear political mandate (Stenekes*, et al.* 2006). This approach is consistent with recent developments in contemporary environmental planning and science communication practice more generally, which have embraced forms of public dialogue and consultation in light of recent technological and environmental controversies. Indeed, in this area a diverse range of engagement techniques – stretching from traditional customer surveys to innovative and creative forms of direct public participation – now increasingly form a central part of modern policy making and institutional practice (Chilvers and Kearnes 2015).

However, in reviewing these developments we have highlighted a series of important implications for the ways in which public consultation is conceived and practised around potable reuse initiatives, and alternative water sources more generally. We have argued that contemporary communication practices are shaped by the assumption that the failure of potable reuse schemes – and the broader controversies around other alternative water source projects – is caused by a lack of public understanding of specialist and technical information. In this model, there is a tendency to depict the general public as *either* acceptors *or* non-acceptors, with the assumption that members of the public might more readily support

reuse projects if they were more aware of basic hydrological concepts and information that demonstrated the safety of the schemes.

In this model, the purpose of public consultation and communication is to provide simplified technical information and, at times, actively persuade people of the merits of potable reuse. Whilst this approach has some strengths – and we note the importance of providing reliable and trustworthy sources of relevant information – we have also highlighted some of its inherent weaknesses. We argue that an approach that suggests that people are *either* acceptors *or* non-acceptors does not adequately reflect the complex, and culturally rich, processes that shape public understanding. Accordingly, we have argued that the 'public acceptance' model mischaracterises public responses to potable reuse and thereby limits the prospects for genuine public participation and consensus building. More broadly, there appears to be a contradiction between commitments to community engagement and public participation in decision-making and the framing of potable reuse as an 'inevitable' development.

2. Moving beyond technological choice

The 'public acceptance' model, we argue, also presented issues around water security and sustainability as a matter of technological design, whereas community engagement and strategic communication initiatives are designed to motivate public acceptance of pre-determined outcomes. This model of community engagement and consultation is consistent with the historic 'pumps and pipes' mode of decision-making around water supply, which has tended to separate out technical and engineering questions from those of community values and participation in decision-making. Where public acceptance is recognised as a critical factor to the successful implementation of alternative water source projects, there is a tendency to focus primarily on issues of safety, reliability and risk by providing assurance to members of the general public and stakeholder communities.

One implication of the separation of technical questions from community values is that engagement initiatives are typically conducted in the downstream phases of alternative water source projects, well after decisions have been taken, and with little scope to influence policy-making and institutional thinking. What we have found in this study is that the values and associations publics draw on to make sense of water recycling are not restricted to questions of safety, risk or feasibility, but rather locate potable reuse in a normative and political context.

The implication of our study is that community engagement processes which confine the scope of public participation to questions concerned with the implementation of water recycling initiatives are unlikely to equip water authorities and planners with an adequate appreciation of the fault-lines of public sentiment. In addition, we have argued that this approach is likely to intensify existing public apprehension concerning the governance of water.

The challenge, we argue, is to develop new modes of public engagement that take seriously the range of ways that people respond to potable reuse. We have argued for an approach developed around the concept of 'common starting points' (Motion and Leitch 2002; Van Riel 1995). Rather than pre-framing public engagement processes as a simply an opposition between 'acceptance' and 'non-acceptance', we argue that a common starting points approach will ensure that engagement processes are responsive to the questions and concerns that are felt to be salient in communities. We argue that these questions are likely to be much broader than those concerned with the safety of recycled water for domestic consumption. For potable reuse schemes to be successful, institutions will need to invest in meaningful avenues for broad-based public engagement concerning Australia's water futures. These strategies need to consider the social fault-lines that shape public responses to potable reuse: need, equity, governance and agency, sustainability and conservation.

3. Creating avenues for ongoing community engagement

The third challenge we identify speaks to the need to build community consultation into decision-making at earlier phases of project conception and design. It is increasingly recognised that creating avenues for diverse publics to consider water futures will require innovation in the ways in which water authorities and companies understand their relationships with the general public (Sofoulis 2005). To date, contemporary water governance has been dominated by relatively "hierarchical management structures predicated on technical expertise, which creates an atomised relationship between individual users and the networks" (Bakker 2010, p. 216). In practical terms, this has meant that the general public are typically understood

as ‘customers’ or ‘service users’, rather than active participants in the social appraisal of water futures. Creating ongoing avenues for public engagement around recycled water will therefore require some degree of institutional innovation, investing in opportunities to create new forms of water citizenship and water democracy (Dargantes*, et al.* 2012).

We argue that proactive approaches that seek, from the outset, to involve publics in agenda setting and decision-making concerning water supply options – and thereby to normalise collective consideration of public debate and discussion of the need to collectively consider the need for new sources of drinking water – will assist in building community consensus around possible responses and options. The focus here should be on building broad public discussion about water – and the future sustainability of water supplies – in which questions of possible technological solutions become a secondary consideration. Community engagement processes should therefore aim to build public discussion and consideration of the need for alternative water sources and develop thorough and deliberative considerations of the range of possible responses.

The challenge then is to co-establish a set of common values that will guide decision-making processes at early stages of the development of projects and to maintain public participation as projects mature toward the construction and implementation phases. Here we draw on Pielke’s (2007) notion of the ‘honest broker’ to articulate a strategy for maintaining credible institutional reputations in developing long-term forms of community engagement and public participation. Reviewing four ‘idealised’ images of the relationship between scientific understanding and policy-making, Pielke distinguishes the concept of the ‘honest broker’ from that of the ‘pure scientist’, the ‘science arbiter’ and the ‘issue advocate’, each of which tends to restrict the scope of public deliberation around science. In contrast, the honest broker ‘seeks to expand, or at least clarify, the scope of choice available to the decision maker’ (p. 13), and, as such, represents a suitable model for building more genuine and long-term community engagement processes.

4. Creating a holistic approach to engagement and communication

Our research indicates that a characteristic feature of contemporary institutional practice is a siloing of community engagement initiatives and communication and media strategies, and a reliance on a relatively limited set of engagement methodologies: market segmentation, target marketing and community surveys. The results of our media analysis and sentiment mapping also suggest that, although the reporting of potable reuse appears to be shaped by well-entrenched media narratives (scarcity, water politics and mismanagement), in general, contemporary media practice tends to be relatively reactive, with little evidence of water authorities building agendas around the need to create alternative sources of drinking water.

We argue that our research findings suggest that an integrated approach – where community engagement and media strategies work in tandem – is the most effective way to work towards greater public awareness of the issues surrounding water supply in Australia and the available options for securing supply into the future.

5. Leveraging the opportunities of social media

Lastly, we suggest that, although social media is an increasingly important space of social interaction and dialogue, water authorities face significant challenges in best utilising social media alongside more traditional media, communications and engagement practices. The accompanying Media Guidelines outline practical steps for addressing this deficit, including integrating social media into broad-based strategies designed to improve modes of public participation in decision-making, and involving a diverse range of perspectives in considering Australian water futures.

References

Alexander, K. S., Price, J. C., Browne, A. L., Leviston, Z., Bishop, B. J., and Nancarrow, B. E. 2008: *Community Perceptions of Risk, Trust and Fairness in Relation to the Indirect Potable Use of Purified Recycled Water in South East Queensland: A Scoping Report*: Urban Water Security Research Alliance, Technical Reoport No. 2.

Allan, J. A. 2002: *The Middle East Water Question: Hydropolitics and the Global Economy*. London: I.B.Tauris.

Arvanitakis, J., and Brown, B. 2013: Scarce Water and the Australian Progress Trap: a commentary. In: R Frances and D. N Bandyopadhyay (eds.) *Remapping the Future: History, Culture and Environment in Australia and India* Newcastle upon Tyne: Cambridge Scholars Publishing, pp. 94-111.

Askewa, L. E., and McGuirk, P. M. 2004: Watering the suburbs: distinction, conformity and the suburban garden. *Australian Geographer* 35(1): 17-37.

Australian Bureau of Statistics. 2013: *Environmental Issues: Water use and Conservation*: Catalogue Number 4602.0.55.003, Australian Bureau of Statistics.

Bakker, K. 2010: *Privatizing Water: Governance Failure and the World's Urban Water Crisis*. Ithaca: Cornell University Press.

Bal, M. 1997: *Narratology: Introduction to the Theory of Narrative*. Second edition. Toronto: University of Toronto Press.

Beck, S., Borie, M., Chilvers, J., Esguerra, A., Heubach, K., Hulme, M., Lidskog, R., E, L., Marquard, E., Miller, C., Nadim, T., Neßhöver, C., Settele, J., Turnhout, E., Vasileiadou, E., and Görg, C. 2014: Towards a Reflexive Turn in the Governance of Global Environmental Expertise. The Cases of the IPCC and the IPBES. *GAIA-Ecological Perspectives for Science and Society* 23(2): 80-87.

Beck, U. 1992: *Risk Society: Towards a New Modernity*. London: Sage.

Beckett, A., and Nayak, A. 2008: The reflexive consumer. *Marketing Theory* 8(3): 299-317.

Beder, S. 1989: *Toxic Fish and Sewer Surfing: How Deceit and Collusion are Destroying our Great Beaches*. Sydney: Allen & Unwin.

Bell, S., and Aitken, V. 2008: The socio-technology of indirect potable water reuse. *Water Science & Technology: Water Supply* 4(441–448).

Bell, V. 2012: Photo-image. In: C Lury and N Wakefield (eds.) *Inventive Methods: The Mapping of the Social*. London: Routledge, pp. 147- 62.

Billig, M. 1987: *Arguing and Thinking: A Rhetorical Approach to Social Psychology*. Cambridge: Cambridge University Press.

Boltanski, L., and Thévenot, L. 2006: *On Justification*. Cambridge, M.A.: Princeton University Press.

Bonyhady, T., and Griffiths, T., eds. 2002: *Words for Country: Landscape & Language in Australia*. Sydney: UNSW Press.

Borraz, O. 2007: Risk and public problems. *Journal of Risk Research* 10(7): 941-57.

Braun, V., and Clark, V. 2006: Using Thematic Analysis in Psychology. *Qualitative Research in Psychology* 3: 77-101.

Brown, R., Farrelly, M., and Keath, N. 2009: Practitioner Perceptions of Social and Institutional Barriers to Advancing a Diverse Water Source Approach in Australia. *International Journal of Water Resources Development* 25(1): 15-28.

Callon, M., Lascoumes, P., and Barthe, Y. 2009: *Acting in an Uncertain World: An Essay on Technical Democracy*. Cambridge, M. A. : The MIT Press.

Carr, R., and Marsden, J. 2013a: *Governance, Decision Processes and Pricing: Implications for Purified Water Projects - Case Study #1 (of 3) – South East Queensland Western Corridor Recycled Water Project*: Marsden Jacob Associates & Australian Water Recycling Centre of Excellence.

———. 2013b: *Governance, Decision Processes and Pricing: Implications for Purified Water Projects - Case Study #3 (of 3) – Water Purification in the ACT*: Marsden Jacob Associates & Australian Water Recycling Centre of Excellence.
Cathcart, M. 2010: *The Water Dreamers: The Remarkable History of Our Dry Continent*. Sydney: Text Publishing.
Chilvers, J. 2013: Reflexive engagement? Actors, learning, and reflexivity in public dialogue on science and technology. *Science Communication* 35(3): 283-310.
Chilvers, J., and Kearnes, M., eds. 2015: *Remaking Participation: Science, Environment and Emergent Publics*. London: Routledge.
Cook, C., and Bakker, K. 2012: Water security: Debating an emerging paradigm. *Global Environmental Change* 22: 94-102.
Dargantes, N., Manahan, M. A., Moss, D., and Suresh, V. 2012: *Water Commons, Water Citizenship and Water Security: Revolutionizing Water Management and Governance for RIO+20 and Beyond*: Our Water Commons Project.
Davies, S., Kearnes, M., and Macnaghten, M. 2009a: All things weird and scary': Nanotechnology, theology, and religious affiliations. *Culture and Religion* 10(2): 201-20.
Davies, S. R., Macnaghten, P., and Kearnes, M., eds. 2009b: *Reconfiguring Responsibility: Lessons for Public Policy. (Part 1 of the report on Deepening Debate on Nanotechnology)*. Durham: Durham University, .
Davison, G. 2008: Down the gurgler: Historical influences on Australian domestic water consumption. In: P Troy (ed.) *Troubled Waters: Confronting the Water Crisis in Australia's Cities*. Canberra: ANU E-Press, pp. 37-65.
Denzin, N. K. 2009: The elephant in the living room: or extending the conversation about the politics of evidence. *Qualitative Research* 9(2): 139-60.
Dolnicar, S., and Hurlimann, A. 2009: Drinking water from alternative water sources: differences in beliefs, social norms and factors of perceived behavioural control across eight Australian locations. *Water Science & Technology* 60 (6): 1433-44.
———. 2011: What affects public acceptance of recycled and desalinated water? *Water Research* 45(2): 933-43.
Dolnicar, S., and Schaefer, A. I. 2009: Desalinated versus recycled water: Public perceptions and profiles of the accepters. *Journal of Environmental Management* 90(2): 888-900.
Douglas, M. 1966: *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. London: Routledge.
Dovers, S. 2008: Urban water: Policy, institutions and government. In: P Troy (ed.) *Troubled Waters: Confronting the Water Crisis in Australia's Cities*. Canberra: ANU E-Press, pp. 81-98.
Dowling, J. 2013: Drinking recycled effluent 'inevitable' in smarter Australia. *Sydney Morning Herald* October 15, 2013.
Edwards, G. A. S. 2013: Shifting constructions of scarcity and the neoliberalization of Australian water governance. *Environment and Planning A* 45(8): 1873–90
Everett, B., Kemp, A., and Napper, K. 2004: *Residential Water Use in Sydney, the Blue Mountains and Illawarra*. Sydney: Independent Pricing and Regulatory Tribunal of New South Wales.
Fam, D. 2014: Urban water policy and actual water use behaviour. *BRIDGING - The Newsletter of the Peter Cullen Water and Environment Trust* 11: 6-7.
Fielding, K. S., Russell, S., and Grace, R. 2010: *Residential Water Demand Management in South East Queensland: A Report on Water Conservation Beliefs*. Urban Water Security Research Alliance, Technical Report No. 24.
Geertz, C. 1993: *The Interpretation of Cultures*. Hammersmith: Fontana Press.
Giddens, A. 1990: *The Consequences of Modernity*. Stanford, CA.: Stanford University Press.

Gilbertson, M., Hurlimann, A., and Dolnicar, S. 2011: Does water context influence behaviour and attitudes to water conservation? *Australasian Journal of Environmental Management* 18(1): 47-60.

Green, M. J., Fielding, K., Leviston, Z., and Price, J. 2010: *Communicating Scientific and Technical Information about Alternative Water Supply Options: A Review of the Literature*: Urban Water Security Research Alliance, Technical Report No. 33.

Gusfield, J. R. 1981: *The Culture of Public Problems: Drink-Driving and the Symbolic Order*. Chicago: University of Chicago Press.

Head, L. 2008: Nature, networks and desire: Changing cultures of water in Australia. In: P Tory (ed.) *Troubled Waters: Confronting the Water Crisis in Australia's Cities*. Canberra: ANU Epress, pp. 67-80.

Head, L., and Muir, P. 2007: Changing cultures of water in eastern Australian backyard gardens. *Social & Cultural Geography* 8(6): 889-905.

Heller, A. 2006: European master-narratives about freedom. In: G Delanty (ed.) *Handbook of European Social Theory* London: Routledge, pp. 257–65.

Herron, V., and Cryle, D. 2011: Water Politics in the Sunshine State: Reportage of the Gold Coast Desalination Project in Two Queensland Dailies, 2006–09. *Queensland Review* 18(2): 216-29.

Heynen, N., Kaika, M., and Swyngedouw, E., eds. 2006: *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*. Abingdon, Oxon: Routledge.

Hilgartner, S., and Bosk, C. L. 1988: The Rise and Fall of Social Problems: A Public Arenas Model. *The American Journal of Sociology* 94(1): 53-78.

Horne, D. 1964: *The Lucky Country*. Ringwood, Vic Penguin.

Hurlimann, A., and Dolnicar, S. 2010: When Public Opposition Defeats Alternative Water Projects - the Case of Toowoomba Australia. *Water Research* 44(1): 287-97.

Irwin, A. 2006: The politics of talk: coming to terms with the 'new' scientific governance. *Social Studies of Science* 36(2): 299-320.

Irwin, A., and Michael, M. 2003: *Science, Social Theory and Public Knowledge*. Maidenhead: Open University Press.

Irwin, A., and Wynne, B. 1996: Conclusions. In: A Irwin and B Wynne (eds.) *Misunderstanding Science: The Public Reconstruction of Science and Technology*. Cambridge: Cambridge University Press, pp. 213–21.

Jenkins, S., and Storey, M. 2012: *What Customers Really Want - Findings of a Value Segmentation Study*. Paper Presented at OzWater 2012, based onStudyby Sydney Water.

Joffe, H. 2003: Risk: From perception to social representation. *British Journal of Social Psychology* 42(1): 55-73.

Kaika, M. 2005: *City of Flows: Modernity, Nature, and the City*. New York: Routledge.

Kearnes, M., Macnaghten, M., and Davies, S., R. 2014: Narrative, Nanotechnology and the Accomplishment of Public Responses. *Nanoethics* 8: 241–50.

Kearnes, M., and Wynne, B. 2007: On nanotechnology and ambivalence: the politics of enthusiasm. *Nanoethics* 1(2): 131-42.

Khan, S. 2013: *Drinking Water Through Recycling: The Benefits and Costs of Supplying Direct to the Distribution System*: Australian Academy of Technological Sciences and Engineering (ATSE).

Latour, B. 2004: Why Has Critique Run out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry* 30: 225-48.

Lejano, R. P., and Leong, C. 2012: A Hermeneutic Approach to Explaining and Understanding Public Controversies *JPART* 22: 793–814.

Lury, C., and Wakefield, N. 2012: Introduction: A perpetual inventory. In: C Lury and N Wakefield (eds.) *Inventive Methods: The Mapping of the Social*. London: Routledge, pp. 1-24.

Mackenzie, J. 2008: Watered down: the role of public participation in Australian water governance. *Social Alternatives* 27(3): 8-14.

Macnaghten, P. 2010: Researching technoscientific concerns in-the-making: narrative structures, public responses and emerging nanotechnologies. *Environment & Planning A* 42: 23 - 37.

Macnaghten, P., Davies, S., and Kearnes, M. B. 2010: Narrative and public angagement: some findings from the DEEPEN project. In: R von Schomberg and S Davies (eds.) *Understanding Public Debate on Nanotechnologies: Options For Framing Public Policies*. Brussels: European Commission, pp. 13-29.

Macnaghten, P., Kearnes, M., and Davies, S. 2015: Anticipating public responses to emerging technologies: a narrative approach. *Journal of Environmental Policy and Planning* forthcoming.

Macnaghten, P., Kearnes, M., and Wynne, B. 2005: Nanotechnology, governance and public deliberation: what role for the social sciences? *Science Communication* 27(2): 268-87.

Marks, J. S., Martin, B., and Zadoroznyj, M. 2008: How Australians order acceptance of recycled water: National baseline data. *Journal of Sociology* 44(1): 83-99.

Marres, N. 2007: The issues deserve more credit: pragmatist contributions to the study of public involvement in controversy. *Social Studies of Science* 37(5): 759-80.

McGuirk, P., and Argent, N. 2011: Population growth and change: implications for Australia's cities and regions. *Geographical Research* 49(3): 317-35.

Motion, J. 1999: Politics as destiny, duty, and devotion. *Political Communication* 16(1): 61-76.

Motion, J., and Doolin, B. 2007: Out of the laboratory: scientists' discursive practices in their encounters with activists. *Discourse Studies* 9(1): 63-85.

Motion, J., and Leitch, S. 2002: The technologies of corporate identity. *International Studies of Management and Organization* 32(3): 45-64.

Motion, J., Lumby, C., Williams, K., Pratt, S., and Beckett, J. 2012: *Modes of Influence and Engagement: A Review of Communication and Water-Related Literature*. Literature Review for National Demonstration Education and Engagement Project, Australian Water Recycling Centre of Excellence. Sydney: University of New South Wales.

National Water Commission. 2010: *Position Statement: Urban Water Recycling*: National Water Commission, Australian Government.

Nelkin, D. 1987: *Selling Science. How the Press Covers Science and Technology*. new York: Freeman.

Ooi, D., Fisher, A., and Cary, J. 2014a: *Water Reuse and Communities Toolkit: Module 1: Community perceptions and barriers to water reuse*: Victoria University & Australian Water Recycling Centre of Excellence.

———. 2014b: *Water Reuse and Communities ToolKit: Module 2: Community Understanding of Risk and Safety in Relation to Recycled Water*: Victoria University & Australian Water Recycling Centre of Excellence.

———. 2014c: *Water Reuse and Communities ToolKit: Module 4: Understanding Customer Attitudes and Segments*: Victoria University & Australian Water Recycling Centre of Excellence.

———. 2014d: *Water Reuse and Communities Toolkit: Module 5: The influence of water scarcity on public willingness to consider water reuse*: Victoria University & Australian Water Recycling Centre of Excellence.

Ormerod, K. J., and Scott, C. A. 2012: Drinking Wastewater: Public Trust in Potable Reuse. *Science, Technology & Human Values* 38(3): 351-73.

Owen, W. F. 1984: Interpretive Themes in Relational Communication. *Quarterly Journal of Speech* 70: 274-87.

Pallett, H., and Chilvers, J. 2013: A decade of learning about publics, participation, and climate change: institutionalising reflexivity? *Environment and Planning A* 45(5): 1162-83.

Pielke, R. A. 2007: *The Honest Broker: Making Sense of Science in Policy and Politics*. Cambridge: Cambridge University Press.

Pink, S. 2013: *Doing Visual Ethnograph*: Sage.
Po, M., Kaercher, J. D., and Nancarrow, B. E. 2003: *Literature Review of Factors Influencing Public Perceptions of Water Reuse*. Report to Australian Urban Water Conservation and Reuse Research Program. CSIRO Land and Water Technical Report 54/03.
Powell, J. M. 2000: Snakes and Cannons: Water Management and the Geographical Imagination in Australia. In: S Dovers (ed.) *Environmental History and Policy: Still Settling Australia*. Oxford: Oxford University Press, pp. 47–72.
Power, M., and McLean, H. 2007: The 'crisis' frame in Australian newspaper reports in 2005. *Australian Journal of Communication* 34(2): 39-57.
Price, J., Fielding, K., and Leviston, Z. 2012: Supporters and Opponents of Potable Recycled Water: Culture and Cognition in the Toowoomba Referendum. *Society & Natural Resources* 25(10): 980-95.
Price, J., Fielding, K., Leviston, Z., Bishop, B., Nicol, S., Greenhill, M., and Tucker, D. 2010: *Community Acceptability of the Indirect Potable Use of Purified Recycled Water in South-East Queensland: Final Report of Monitoring Surveys*: Urban Water Security Research Alliance, Technical Report No. 19.
Prime Minister's Science Engineering and Innovation Council. 2003: *Recycling Water for Our Cities*. Canberra: Prime Minister's Science, Engineering and Innovation Council.
Productivity Commission. 2011: *Australia's Urban Water Sector*: Report No. 55, Final Inquiry Report, Canberra.
Puchta, C., and Potter, J. 2004: *Focus Group Practice*. London: Sage.
Queensland Water Commission. 2010: *South East Queensland: Water Strategy*. Brisbane: Queensland Water Commission.
Randolph, B., and Troy, P. 2011: Attitudes to conservation and water consumption. *Environmental Science & Policy* 11(5): 441-55.
Rose, D. B., van Dooren, T., Churlew, M., Cooke, S., Kearnes, M., and O'Gorman, E. 2012: Thinking through the environment, unsettling the humanities. *Environmental Humanities* 1: 1-5.
Rose, G. 2012: *Visual Methodologies: An Introduction to Researching with Visual Materials*: Sage.
Roulston, K. 2010: *Reflective Interviewing: A Guide to Theory and Practice*. London: Sage.
Russell, S., Lux, C., and Hampton, G. 2008: Beyond "Information": Integrating Consultation and Education for Water Recycling Initiatives. *Society & Natural Resources: An International Journal* 22(1): 56-65.
Scott, J. C. 1998: *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.
Simpson, J. 2008: *From Waste-d-Water to Pure Water*. Vol. Woombye, Qld: Self published.
Simpson, J., and Stratton, H. 2011: *Talking about water: words and images that enhance understanding*. Waterlines Report, Canberra: National Water Commission.
Sofoulis, Z. 2005: Big Water, Everyday Water: A Sociotechnical Perspective. *Continuum: Journal of Media & Cultural Studies* 19(4): 445-63.
———. 2011: Skirting complexity: The retarding quest for the average water user. *Continuum: Journal of Media & Cultural Studies* 25(6): 795-810.
Sofoulis, Z., Williams, C., Campbell, M., and Rossiter, P. 2007: *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.
Stallings, R. A. 1990: Media discourse and the social construction of risk. *Social problems* 37(1): 80-95.
Stenekes, N., Colebatch, H. K., Waite, D. T., and Ashbolt, N. J. 2006: Risk and Governance in Water Recycling: Public Acceptance Revisited. *Science Technology and Human Values* 31(2): 107-34.

Stirling, A. 2008: "Opening up" and "closing down": power, participation and pluralism in the social appraisal of technology. *Science, technology & Human Values33* 2(262-294).
Strang, V. 2004: *The Meaning of Water*. Oxford: Berg.
———. 2006: Water Recycling: an issue of substance. *Water* 33(8): 6.
Strengers, Y. 2011: Beyond demand management: co-managing energy and water practices with Australian households. *Policy Studies* 32(1): 35-58.
Sultana, F., and Loftus, A. 2012: *The Right to Water: Politics, Governance and Social Struggles*. London Earthscan Water Text Series, Routledge.
Swyngedouw, E. 2004: *Social Power and the Urbanization of Water: Flows of Power*. Oxford: Oxford University Press.
Syme, G. J., and Hatfield-Dodds, S. 2007: The role of communication and attitudes research in the evolution of effective resource management arrangements. In: K Hussey and S Dovers (eds.) *Managing Water for Australia: The Social and Institutional Challenges*. Collingwood, Victoria: CSIRO Publishing, pp. 11-22.
Tal, A. 2011: The desalination debate—Lessons learned thus far. *Environment: Science and Policy for Sustainable Development* 53(5): 34-48.
Trigger, D. S., and Griffiths, G., eds. 2003: *Disputed Territories: Land, Culture and Identity in Settler Societies*. Hong Kong: Hong Kong University Press.
Troy, P. 2008: A new solution. In: P Troy (ed.) *Troubled Waters: Confronting the Water Crisis in Australia's Cities*. Canberra: ANU E-Press, pp. 187-210.
Van Dijk, A. 2013: Australia is not ready for the next big dry. *The Conversation* 19 March 2013.
Van Riel, C. B. 1995: *Principles of Corporate Communication*. London: Prentice Hall.
Wahlquist, A. 2003: Media representations and public perceptions of drought. In: L. C. Botterill and M. Fisher (eds.) *Beyond Drought: People, Policy and Perspective*. Collingwood: CSIRO, pp. 67-86.
Wallis, P. 2012: The drought strikes back: how decentralised water supplies will beat the next dry season. *The Conversation* 7 May 2012.
Watson, S. 2014: Mundane objects in the city: Laundry practices and the making and remaking of public/private sociality and space in London and New York. *Urban Studies*.
Weaver, D. A., Lively, E., and Bimber, B. 2009: Searching for a frame news media tell the story of technological progress, risk, and regulation. *Science Communication* 32(2): 139-66.
Weber, M. 1978: *Economy and Society: An Outline of Interpretive Sociology*. Edited by Guenther Roth and Claus Wittich, Berkeley: University of California Press.
Weick, K., Sutcliffe, K. M., and Obstfeld, D. 2005: Organizing and the Process of Sensemaking. *Organization Science* 16(4): 409-21.
Wynne, B. 2006: Public engagement as a means of restoring public trust in science - hitting the notes, but missing the music? *Community Genetics* 9(3): 211-20.
———. 2008: Elephants in the rooms where publics encounter "science"?: A response to Darrin Durant, "Accounting for expertise: Wynne and the autonomy of the lay public". *Public Understanding of Science* 17(1): 21-33.
Young, L., and Barrett, H. 2001: Adapting visual methods: action research with Kampala street children. *Area* 33(2): 141-52.