



Collaborative Water Planning Project

Rural Darwin (NT) Case: Analysis of Stakeholder Interests in the Ground Water Resources of the Howard East Aquifer

by Sharna Nolan
CSIRO, Sustainable Ecosystems

June 2009



Australian Government Water Fund
Raising National Water Standards



Acknowledgements

TRaCK brings together leading tropical river researchers and managers from Charles Darwin University, Griffith University, University of Western Australia, CSIRO, James Cook University, Australian National University, Geoscience Australia, Environmental Research Institute of the Supervising Scientist, Australian Institute of Marine Science, North Australia Indigenous Land and Sea Management Alliance, the International WaterCentre and the Governments of Queensland, Northern Territory and Western Australia.

TRaCK receives major funding for its research through the Australian Government's Commonwealth Environment Research Facilities initiative; the Australian Government's Raising National Water Standards Programme; Land and Water Australia and the Queensland Government's Smart State Innovation Fund.



Disclaimer

TRaCK has published the information contained in this publication to assist public knowledge and discussion and to help improve the sustainable management of Australia's tropical rivers and coasts. Where technical information has been prepared by or contributed by authors external to TRaCK, readers should contact the author(s), and conduct their own enquiries, before making use of that information. No person should act on the contents of this publication whether as to matters of fact or opinion or other content, without first obtaining specific independent professional advice which confirms the information contained within this publication.

Copyright

Copyright of this publication, and all the information it contains, belongs to the Land and Water Resources Research and Development Corporation, with its brand name being Land & Water Australia (LWA). LWA grants permission for the general use of any or all of this information provided due acknowledgement is given to its source.

Table of Contents

Executive Summary	6
Project Introduction	7
The Howard East Aquifer: A brief overview	8
Why are stakeholder analyses important?	9
Objectives of Howard East stakeholder analysis	9
Methods: Defining stakeholders in the Howard East.....	10
Interviews	11
Secondary Data sources	11
Describing stakeholders in the Howard East Water Allocation Planning Area. 12	
Indigenous Groups and Traditional Owners.....	12
Commercial and Industrial sector	14
Primary industries.....	14
Secondary & Tertiary Industries	16
Government	18
Environment Groups.....	21
Recreational User Groups	22
Community groups	23
Measuring stakeholder experience and interest in planning processes.....	26
Issues over water management in the Howard East Aquifer: Key findings	29
Delving deeper: prioritising issues of concern amongst stakeholders.....	33
1. A wide spread lack of understanding of groundwater systems and related pressures, and a lack of confidence in the science underpinning decision making	34
2. Concern about the environmental, social and economic trade-offs involved to meet current and future urban and rural water needs	36
3. Lack of confidence or trust of government driven planning and decision making processes.....	36
4. Concern around licensing procedures, rules and potential caps for commercial users and developers	37
5. A lack of social, economic or environmental imperative to save water or manage demand for water.	38
6. A lack of a strategic planning framework or manpower to enforce rules and regulations to protect areas of cultural or ecological significance.....	38
Issues raised by Howard Springs residents in other CSIRO workshops	39
Issues of most concern.....	40
Issues of least or mixed concern	41
Main themes to emerge from stakeholder key issues analysis	42
Stakeholder Knowledge Gaps: Areas of interest to stakeholders	42
Stakeholder Needs Assessment	43
Adequate provision of resources	44
Effective modes of communication	44
Building group capacity and keeping people informed	45
The importance of workshops, face to face meetings and site events	46

WAC Membership – working to clear guidelines and accountability.....	46
Timing and the creation of a ‘safe space’ for dialogue	47
Thinking strategically about new ways to manage resources.....	48
Making policy decisions relevant to stakeholders	48
Finding the right ‘balance’ between stakeholders that represents all interest groups	49
Summary of stakeholder recommendations for initiating HEWAC.....	49
.....	49
Summary and conclusions for stakeholder analysis	50
References.....	52
Annex A: Questionnaires, Information pack and Consent forms	54
Consent Form.....	56
Research Team.....	56

List of Figures

Figure 1. Map showing the boundaries of the Howard East aquifer, known as the Koolipinyah Dolomite Aquifer (Source: NRETAS 2008).....	8
Figure 2: Interest in participating in TEWAC and previous water planning experience, as expressed by stakeholders.....	26
Figure 3: Topics of interest to stakeholders (Source: Authors interviews).....	43

List of Tables

Table 1: Stakeholder categories for the TEWCD.....	10
Table 2: Stakeholder categories and summary of Figure 3.....	27
Table 3: Key concerns of stakeholder, divided by industry sector.....	29
Table 4: Key issues raised by stakeholders in the Howard East.....	33
Table 5: Issues deemed important by Howard Springs stakeholders in CSIRO workshops (Source: Woodward et al 2008).....	39
Table 6: Key recommendations for HEWAC derived from stakeholder interviews....	49

Acronyms used in this document

AFANT	Amateur Fishermen’s Association of Northern Territory
AGM	Annual General Meetings
CDU	Charles Darwin University
CoC	Chamber of Commerce
CSIRO	Commonwealth Scientific & Industrial Research Organisation
DHAC	Darwin Harbor Advisory Committee
DPI	Department of Planning and Infrastructure
DRCRG	Daly River Community Reference Group
DRDPIFR	Department of Regional Development, Primary Industry, Fisheries and Resources
DRWAC	Darwin Rural Water Advisory Committee
DRWCD	Darwin Rural Water Control District
ECNT	Environment Centre Northern Territory
EIA	Extractive Industries Association
GA	Greening Australia
Girraween LC	Girraween Landcare group
HEWAC	Howard East Water Advisory Committee
HEWAPA	Howard East Water Allocation Planning Area
Holtze LC	Holtze Landcare group
ILUA	Indigenous Land Use Agreement
KWAC	Katherine Water Advisory Committee
LGANT	Local Government Association Northern Territory
McMinns LC	McMinns Landcare group
NAILSMA	Northern Australia Indigenous Land & Sea Management Alliance
NESB	Non English Speaking Background
NGO	Non Government Organisation
NLC	Northern Land Council
NTCA	Northern Territory Cattlemen’s Association
NTEC	Northern Territory Environment Centre
NTFG	Northern Territory Field and Game
NTG	Northern Territory Government
NTHA	Northern Territory Horticultural Association
NTRC	Northern Territory Resources Council
NT Tourism	Northern Territory Tourism Council
NRETAS	Department of Natural Resources, Environment and the Arts
NWC	National Water Advisory Committee
NTPWC	Northern Territory Parks and Wildlife Commission
PWC	Power and Water Corporation
WWF	World Wildlife Fund

Executive Summary

In July 2008, NRETAS invited the TRaCK research team to prepare a stakeholder analysis to inform the development of water allocation planning and community consultation strategy for the Howard East Aquifer, in rural Darwin. This document represents the main findings of this study.

Between August and November 2008, thirty five stakeholder representatives and community members were interviewed to discuss the issues of concern that they would like to be raised during regional water allocation planning. Interviewees were selected to represent Traditional owners, Industry (Primary, Secondary & Tertiary), urban residents, peri-urban residents, community groups, environmental groups, Government (Local, Territory & Federal) and research & education agencies.

Key findings indicate that there are six main areas that stakeholder would like considered in regional water planning. These are:

1. Many stakeholders have difficulty understanding the groundwater systems or the previous models that inform current decision making.
2. There is a lack of trust in the community of government driven planning
3. Some stakeholders have felt excluded from previous decision making and planning
4. There are trade-off decisions involved in securing future peri-urban, urban and commercial water supplies for Howard East, Darwin, Palmerston and Wendell.
5. There is concern about a lack of planning framework in place for protecting places of high conservation or recreational value, providing incentives for sustainable resource use or protecting water dependent livelihoods

These issues are discussed at length in this analysis using quotes from individual stakeholders. Additionally, stakeholders were asked to detail the capacity and motivation of their group to participate in the regional water advisory committee (Howard East Water Advisory Committee) and to reflect on barriers or enablers to their participation in the planning process.

From interviews it is clear that stakeholders have a range of expectations, needs and abilities to meaningfully contribute to the water advisory committee. Fourteen of the eighteen stakeholder groups interviewed reported interest in participating regional planning processes, however many are time and resource poor and will require specialised support. A number of recommendations outlining the type of support required are provided in the last sections of this study.

The results of this work aims to inform the selection of a 'fit-for-purpose' planning tool that can better engage the Howard East community in water planning. Lessons from this work (and four other case studies) will be pooled and inform a national toolkit detailing a number of methods, strategies and workshops that elicit community engagement and confidence in water allocation planning.

Project Introduction

The 'Collaborative Water Planning' project is funded through TRaCK – the Tropical Rivers and Coastal Knowledge research hub. The project aims to develop and pilot tools that enhance community and stakeholder participation in water planning, as provided for under the National Water Initiative. More specifically, the project will work with water planners and community members to review, promote and trial:

- Innovative ways to involve urban and peri-urban communities, government agencies, industry groups, conservation groups and indigenous representatives and landholders in water planning processes for the Darwin region.
- New approaches to sharing information and incorporating social, environmental, economic and cultural values into water planning, especially those held by indigenous people,.
- Successful tools and techniques that develop strong partnerships among stakeholders, involve communities in planning processes and give subsequent water plans traction within the broader regional community.

The Howard East aquifer in rural Darwin was chosen as one of two case studies to represent water planning in Northern Australia, the other is in far north Queensland. A research agreement was signed between CSIRO, Griffith University and the NT Department of Natural Resources, Environment and the Arts (NRETAS) Water Management staff in July 2008, outlining project aspirations to support forthcoming water allocation planning processes and develop locally appropriate planning tools. Nearly one year later, this research partnership has led to the development of a participatory groundwater modelling exercise that is currently being undertaken with stakeholders, hydrologists and modellers within the Howard Springs community.

The stakeholder analysis contained in this document was considered to be a starting point for the project. Its utility has prompted NRETAS to request the project team to publish it as a standalone document to inform the decisions of the Howard East Water Advisory Committee (HEWAC). This new water advisory committee will be established in the next few months. A much condensed version will also be available for the projects final report, due October 2009.

This report aims to give water planners a better understanding of the needs and attitudes of stakeholders in the Howard East region. Based on the results of over 35 stakeholder and agency interviews, it informs researchers and water planners of the range of issues and concerns affecting stakeholders regarding water resources and indicates the interests and needs of specific groups to participate in the forthcoming HEWAC. NRETAS' water planners have been consulted extensively throughout this process. The analysis has assisted NRETAS' to finalise the membership of the HEWAC and informed regional communication and engagement strategies.

Lastly, it is important to note that this analysis builds on recent work undertaken by CSIRO in late 2008 within the Howard River region¹. Commissioned by the NT Natural Resource Management Board, the project delivered a comprehensive overview of the history and planning context of water resource use and management in the Howard River region. The study examined the social and cultural values that

¹ Woodward, E., Jackson, S. and Straton A., (2008), Howard River environmental flows and social values: A project to support water planning in the Howard River Catchment, 2008.

were locally significant for regional residential and stakeholder groups, both through qualitative interviews and a literature review. When combined, both reports build a detailed understanding of the regional planning context and perspectives of a wide range of people on the uses, values and management of water resources in rural Darwin.

The Howard East Aquifer: A brief overview²

The Howard East aquifer is relatively small yet high yielding aquifer that borders Darwin and Palmerston. Soon to be declared the Howard East Water Allocation Planning Area (HEWAPA), the area captures much of the peri-urban community in Howard Springs and Humpty Doo, and several lagoons systems that drain the Howard River Catchment. Located approximately 20 kilometres from Darwin, the border extends south from Howard Springs and follows roughly the same direction as the Arnhem Highway, before cutting north at Humpty Doo and meeting the Adelaide River. This forms the western boundary of the aquifer until it meets the sea close to Gunn Point.

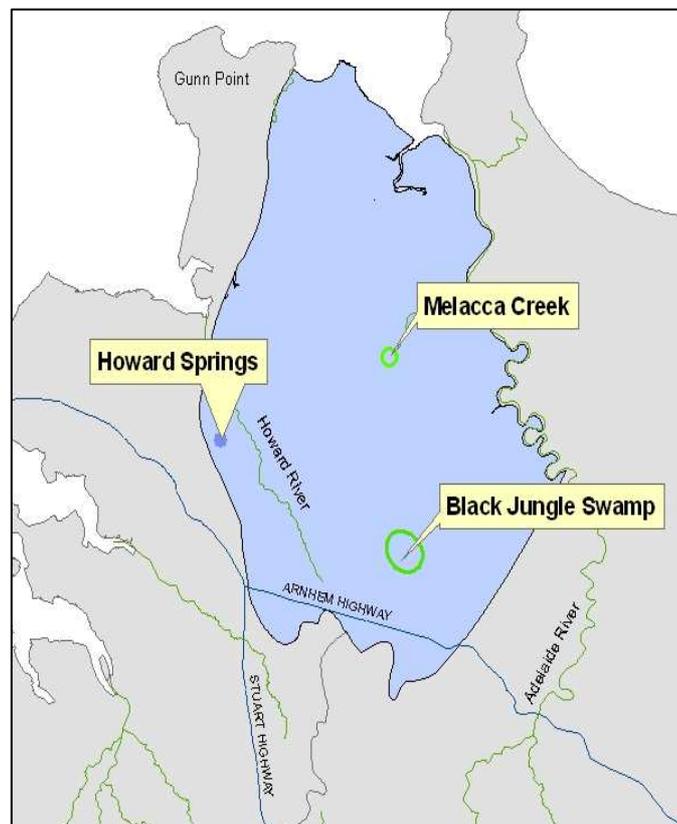


Figure 1. Map showing the boundaries of the Howard East aquifer, also known as the Koolipinyah Dolomite Aquifer (Source: NRETAS 2008)

The Howard East aquifer is home to a diverse range of economic activities. Of the total amount of ground water extracted (20 000 Ml³) from the two aquifer systems⁴,

² As mentioned previously, a regional overview of the Howard Springs region is given in Woodward et al (2008) "Water Resources of the Howard River Region NT: a report on the social and cultural values", available at URL: <http://www.csiro.au/resources/HowardRiverReport.html>

the majority is used to irrigate a range of tropical horticultural crops and Asian vegetables (50%). A further 30% is used by rural residents in private, unregulated bores for 'stock and domestic' purposes. This figure has grown prolifically over the past 5 years and is prompting concerns about the sustainability of current rates of extraction. The remainder of water extracted (15%) is used to augment Darwin's urban water supply by Power Water Corporation (NRETAS 2005).

Why are stakeholder analyses important?

Stakeholder analyses represent an important first step in project planning. The method helps planners adapt a planning process to reflect local needs or values and fairly represent a balanced view of community, environment and commercial interests in a water advisory committee. For the Darwin region, where little previous planning had taken place, the stakeholder analysis aimed to determine the 'right people' for engagement and to build understanding of their knowledge, needs and interests. It also sought to identify those actors with significant influence or power over the planning process, allowing agency staff to plan accordingly.

Importantly, the study also sought to understand the preferred method of engagement of different stakeholders and document the factors each considered would better enable their participation in planning. In doing so, this knowledge can lay the groundwork for on going community engagement and communication strategies.

Objectives of Howard East stakeholder analysis

Given the lack of previous water or resource planning in the Howard East, a stakeholder analysis was considered an essential first step for developing understanding the social, economic, political and cultural context of the study area. A research process was therefore designed to meet the following objectives:

- determine which stakeholders and community groups should be involved in the Howard East water allocation planning process
- understand the values, interests, needs and issues of stakeholders in relation to water resource and allocation planning
- identify the enablers and barriers in local stakeholder networks to their participation in planning processes
- draw out any conflict of interests between stakeholders that may influence planning outcomes
- understand stakeholder knowledge, communication preferences for engagement at different stages of the planning process
- build stakeholder ownership into subsequent water plans

³ A megalitre is a million litres.

⁴ The aquifer consists of two main layers, a surface layer made up of cretaceous rock that experiences significant drawdown over the dry season, and a deeper dolomite layer that can purportedly produce yields of water up to 60 litres per second. Water drawn from both layers has distinct chemistry and mineral content.

Methods: Defining stakeholders in the Howard East

At the time of the study many of the stakeholders contacted in the rural Darwin area had little previous experience with a research or a resource planning process. The information gained in this process was therefore considered to be new, making semi-structured interviews an appropriate method of engagement. Questions were tested with other researchers and adapted over the course of several interviews, held at the office or home at the discretion of the interviewee.

Questionnaires, consent forms and project information packages can be found in the appendices.

Stakeholders with a 'stake' in regional water resources and planning were initially identified through interviews with NRETAS water planners, the DHAC Executive Officer and CSIRO researchers⁵ familiar with water management and affected stakeholders in the Howard East. In interviews, participants were asked to name additional contacts in their sector (thus introducing a snowballing sampling technique) to find new stakeholders. This was useful for drawing upon existing community and industry networks.

Seven stakeholder categories were devised with nineteen regional sub-categories. Broadly, regional stakeholder categories represent Traditional owners, Industry & Commercial interests (Primary, Secondary & Tertiary), Residents (mainly peri-urban or rural based), Community & Recreational groups, Environmental groups, Government (Local, Territory & Federal) and Research & Education agencies.

Table 1: Stakeholder categories for the Howard East Aquifer

Stakeholder Category	Sub-categories	Darwin regional representation
Traditional Owners	Larrakia, Kungarrikan, Wulna, Wajigan, Limilngan, Warai	Larrakia Harbour Committee Northern Land Council, Indigenous Ranger groups, North Australian Indigenous Land & Sea Management Alliance
Industry and Commercial interests (Primary, Secondary & Tertiary)	Agriculture	NT Horticultural Association, Local agribusiness suppliers and market grower representatives
	Pastoral & Mining	NT Cattlemen's Association NT Resources Council, Dept. of Regional Development, Primary Industry, Fisheries and Resources, Extractive Industry Association (DRDPIFR)
	Aquaculture & Fisheries	DRDPIFR
	Engineering, energy and water supply Hospitality & Tourism	Power Water Corporation, Dept. Planning and Infrastructure Chamber of Commerce, NT Tourism Council
	Building & Construction	Chamber of Commerce, Development Consent Authority
Residents	Retail & Hospitality Urban	Supplied by Power Water Corporation Darwin Harbour Advisory Committee,

⁵ Sue Jackson, Emma Woodward and Melanie Bradley from CSIRO.

	Peri-Urban/Rural	Urban land care groups Peri-urban land care groups, Shire council members, recreational user groups, growers and mixed farm enterprises
Community groups	Land care	Girraween, McMinns & Knuckeys, Holtze, Darwin River, Friends of Fogg Dam
	Greening Australia 'Water For Life' groups Recreational User groups	Greening Australia, Top End office Amateur Fishermen's Association NT, NT Field and Game.
Environmental Groups		Environmental Centre NT, World Wildlife Fund
Government	Local State	Independent members NRETAS, DRPIFR, DPI, Parks & Wildlife Commission
	Federal	National Water Commission, Department of Defence
Research and Education	Tertiary	CDU, Griffith University
	Research Institutions	CSIRO, Tropical Rivers and Coastal Knowledge, Land & Water Australia

Interviews

Interviewees were asked to discuss their concerns about water management and reflect critically on their experiences from previous water planning or NRM planning processes. Each was also asked to comment on the networks or relationships within the community that may affect the outcome of the process, outline specific preferences for communication and rank the areas of interest, about which they would like to receive more information.

Selected participants were sent a project information package via email before being contacted by phone to arrange an interview time. The bulk of stakeholder interviews were conducted from July to September, 2008. At the beginning of each interview, participants were again introduced to project objectives, and asked to sign consent forms. Where appropriate, interview transcripts have been sent back to participants for review.

Secondary Data sources

A range of secondary data resources were drawn upon to build understanding of the context of the case study area. These included:

- ABC Rural Country Hour archives
- Northern Territory News newspaper archives
- Maps and documents found on the NRETAS and Department of Regional Development, Primary Industries, Fisheries and Resources (DRDPIFR) websites
- Proceedings of previous workshop held by CSIRO Howard Springs project

- CSIRO literature (e.g. Woodward et al, (2008) Social and Cultural Values of Water in the Howard River Catchment, Jackson and O'Leary, (2006) Indigenous Interests in Tropical Rivers: Research & Management Issues,)
- Workshop Proceedings (Technical Workshops for the Darwin Harbour Regional Plan of Management: Current knowledge and future needs, Hosted by the Darwin Harbour Advisory Committee, Northern Territory University, Darwin, February 2003)
- Management and Conservation Plans (McMinn's Lagoon, Knuckey Lagoons Conservation Reserve, Holmes Jungle Nature Park, Howard Springs Recreational Reserve)
- Public submissions and reports prepared by land care groups (Girraween Lagoon: condition, threats and strategies for sustainable use, prepared by the Girraween Landcare Group Inc., August 2007)
- Planning documentation and Land Use Plans (Litchfield Planning Concepts and Land Use Objectives, Department of Planning and Infrastructure)
- Stakeholder literature and websites (e.g. Living River Policy – WWF, Cattlemen's Association, Land Use Guidelines Northern Territory Horticultural Association)
- Draft and finalised Water plans for other Water Control Districts in the Northern Territory (Katherine/Tindal, Alice Springs)
- Strategy and Management plans for the Darwin Harbour Advisory Committee (DHAC).

Describing stakeholders in the Howard East Water Allocation Planning Area

Stakeholders of the Howard East area are briefly profiled below, according to the categories outlined in the previous section. Each is described in terms of their interest and capacity to participate in a water planning process, and their influence over other groups and the outcome of the project.

Indigenous Groups and Traditional Owners

Larrakia Nation

The Larrakia, known also as the 'saltwater people', represent the Aboriginal language group with recognised cultural and customary links to the Darwin Harbour area (Larrakia Nation 2008). Traditional boundaries of Larrakia land extend approximately 50 kilometres inland, capturing peri-urban Darwin, parts of Cox Peninsula and Gunn Point. The rights and aspirations of the Larrakia people are expressed by the Larrakia Nation Aboriginal Corporation and overseen by a governing committee of elders. As well as being a consultative body, the Corporation has the dual role of administering a range of programs aimed at improving the health, education and employment opportunities of Larrakia people. The Corporation also supports a number of male and female ranger groups with skills in land and sea management.

Recent work by CSIRO (see Woodward and Jackson 2008) employed a traditional owner to interview Larrakia people to determine the values and activities deemed

important for local rivers, lagoons, riparian zones, monsoon jungles and wetlands. Activities related to hunting and collecting a wide variety of foods (e.g. long-neck turtle, goose, milky plum, freshwater prawns, water lilies, barramundi, catfish, yabbies, file snake, goanna, cockles, crabs, stingray, wallaby, kangaroo, possum, bandicoot) ranked very highly. Aboriginal people also liked to visit special places to maintain a cultural connection to the present and past and look after them, remember stories and share cultural knowledge with others. They also valued these places for gaining personal inspiration for paintings.

A collaborative research effort involving Larrakia people in an archaeological survey for Indigenous cultural heritage sites around the Darwin Harbour identified four main uses of customary places⁶:

- Cultural/Practical Use (harvesting, hunting, camping, refuge etc)
- Spiritual Use (Sensitive areas, relating to ceremony and 'dreamings')
- Educational Use (Ideal site for interpretations, protected for archaeological research)
- Economic Use (tourism and management)

There are a number of sacred sites that are important for the Larrakia people. Many were described by Donna Jackson, coordinator of the Larrakia Harbour Committee, in her recent speech given at Charles Darwin University⁷;

'the main dreaming track that cuts through (underneath) the Cox Peninsula, is the Kenbi Dreaming Track, we know this as the pathway of the Rainbow Serpent. It is one of the most important dreaming tracks for the Larrakia and neighbouring language groups. One of the focal points along the Kenbi dreaming track is the sacred waterhole at Belyuen. Another, close to Darwin, is the small reef visible at low tide off Casuarina beach....other sacred sites associated with water in Darwin include One Mile Dam, Holmes Jungle and the spring on RAAF land at the top of Rapid Creek.'

Lorraine Williams, a Larrakia research associate at Charles Darwin University, also described a number of sacred sites in her submission to the Darwin Harbour Advisory Committee. In her paper she associates areas of high significance with the many middens, mounds and fish traps found around the Harbour made from Larrakia groups camping, hunting and collecting shellfish. She also identifies culturally sensitive areas around Mount Dumigan, where some Larrakia elders still remember ceremonial grounds, burial grounds and dreaming sites.

Larrakia Harbour Committee

The Larrakia Harbour Committee represents the interests of the Larrakia Nation to the Darwin Harbour Advisory Committee. Comprising of key Larrakia family members, the group meets on an as needed basis and has links to the broader indigenous community.

For the purposes of this study, the group has indicated that it has a strong desire to participate in the Howard East Aquifer water allocation planning process. These aspirations were recently reiterated by Donna Jackson, who noted:

⁶ See study by Lorraine Williams, 'A Larrakia perspective of Larrakia archaeological sites and levels of significance', prepared for the Darwin Harbour Advisory Committee.

⁷ Jackson, D., 'Equitable access and water rights in the NT, an indigenous perspective'. Presented at the Charles Darwin University Water Symposium, May 2008.

'The health and maintenance of these sites and waterways is very important to Aboriginal people... We want to work together with good trust worthy water managers, whose motivations are not polluted with hidden agendas. Water is increasingly becoming too precious to be allowed to be controlled by those whose only concern is how much they can benefit for their own, or corporate, benefit.'

North Australian Indigenous Land & Sea Management Alliance (NAILSMA)

NAILSMA is an unincorporated body that represents an alliance between the north Australian Land Councils and the Balkanu Cape York Development Association. Its staff support the practical management of country by traditional owners (organised into land and sea manager networks) through capacity building, advocacy efforts and engaging with research across the Top End.

NAILSMA has recently established an Indigenous Community Water Facilitator Network across the Top End, using funding from the National Water Commission. Six indigenous community water facilitators will be supported in selected communities and provide indigenous input and advice into research and policy, as well as networking across Indigenous management groups. NAILSMA will provide support through communication, training, education, Indigenous engagement in research and strategic planning. The program has recently commenced and is funded to 2011.

Northern Land Council (NLC)

Established in 1973 to represent the rights and interests of Aboriginal people across the Top End, the NLC has evolved into a management agency to manage Indigenous free hold land across the top half of the Northern Territory and to represent native title holders in the region. Its primary function is to liaise with government departments, research agencies and the myriad of companies wishing to access Aboriginal land.

Land and water management falls under the responsibility of the Caring for Country Unit. This unit trains and supports more than 20 Aboriginal ranger groups across the Top End through a series of workshops, research programs and ranger training. We have been unable to engage the NLC in this project

Commercial and Industrial sector

Primary industries

Northern Territory Resources Council

The NT Resources Council (NTRC) has grown from the NT Minerals Council which has represented the mining industry since 1955. Reflecting the views of some of the largest mining companies in the world, the NTRC is closely linked with the Minerals Council of Australia, which promotes Australia's mining industry internationally and ensures that its operational guidelines are compliant with international practice.

The NTRC plays a major role in negotiating positive policy outcomes to support the growth of Northern Territory's mining industry on behalf of its members, and subsequently has a strong relationship with State and Federal governments. While it operates with only 2 staff, it has an efficient group structure that can quickly draw upon, and liaise with a range of experts in large mining companies to develop an

industry position. The NTRC represents the industry position to the broader public through mass media channels.

While nearly 100% of the tonnage exported from the NT is captured in its membership, small scale operators supplying local markets, such as sand miners operating in the Howard River, are unlikely to be associated members. The NTRC is therefore unlikely to be interested in the Howard East Aquifer water planning process, however would like to be kept informed of the process through mail outs.

Extractive Mining Association

Representing sand mining operations at Howard Springs, this association meets regularly and has an executive body made up of local operators. The industry is regulated according to the terms of individual 'extractive mining title' and relies heavily on the information and support provided by the Department of Regional Development, Primary Industries, Fisheries and Resources (DRPIFR). When contacted, the association was interested in nominating a member for consideration into the WAC for the Howard East Aquifer planning process, however declined to be interviewed for this study.

Horticulture

Northern Territory Horticultural Association (NTHA)

The NTHA represents the view point of the local horticultural industry to government and the broader community. Located in offices in the Coolalinga Shopping Centre of Howard Springs, the association employs 3 fulltime staff who is overseen by a committee of nine local industry representatives. It provides strategic direction for the industry and is an important source of information and networking for its members wishing to link to other associations at the national and international level.

With over 200 affiliated members, its membership captures the vast majority of commercial growers in the industry. The Howard East Aquifer is a priority to its membership as the area hosts a large percentage of the Territories horticulture and vegetable enterprises. In interviews the NTHA has relayed that it is very interested in participating in HEWAC, and has previously contacted and nominated growers to represent the industry the Katherine and Daly water planning process. With ninety percent of its membership receiving regular electronic updates and newsletters on line, it has the capacity to get information and feedback quickly from commercial scale growers.

The NTHA is proactive and has the capacity to undertake research and field days through its grower base, and is in the process of starting up small scale research trials that look at water use and efficiencies in the cut flower industry. Funding for this work has been sought independently of regular government channels and has a number of grower field days attached to it to improve the adoption of results. One field day will focus on irrigation efficiencies with the potential for a discussion on water allocation planning. Additionally, a growers meeting to discuss the implications of regional water allocation planning is forecast for early July 2009.

In general, the NTHA captures many of the commercial growers in the Howard area however misses the valuable Asian vegetable sector which has recently doubled its output to achieve \$22 million⁸ in 2005 (DPIFM). Representing a major water user,

⁸ See Government statistics at URL:

http://www.nt.gov.au/d/Primary_Industry/index.cfm?header=Vegetables%20-%20Asian

this sector is dominated by growers from non-English speaking background that are very difficult to engage. The NTHA also does not engage the small scale mango growers that dominate the Howard Springs Aquifer. As one member of the NTHA commented;

“Getting different groups together within the horticultural community will be a major problem. There are issues of scale. You’ve got the people who planted 2 acres of mangos who still consider themselves to be primary producers...and a lot of people living here are Vietnamese that have huge language difficulties...There’s not really any mutual ground there are there’s very little common ground”.

In interviews, the NTHA described its relationship with staff within DRDPIFR (Primary Industries) and NRETAS as poor.

Pastoralists

Northern Territory Cattlemen’s Association (NTCA)

Representing a range of stakeholders in the live export cattle industry, the NTCA forms the lobby and support group for approximately 90% of the pastoralists, fodder crop producers and support industries located in the Northern Territory. As well as providing marketing and local media support, the cattlemen’s group also provides members with up-to-date information on local and international markets, road conditions and relevant livestock research.

Much of regional Darwin is tenured under several pastoral leases which supports a number of pastoral properties that can carry up to 70 000 head of cattle⁹. Pastoralists require continued and growing access to bores and floodplain country, having implications across the Top End and, to a smaller extent, the Howard East Water Allocation Planning Area (HEWAPA). A number of market and climate driven factors impact the numbers and timing of cattle in the area, meaning that it will be important to ensure water allocations can accommodate change.

The NTCA is well organised and has strong connections to NT Government and media channels. It has previous water planning experience in the Katherine and Daly regions and a strong lobbying power in all rural areas located in, and adjacent to Darwin. Like the NTRC, it is not directly impacted by planning in the HEWAPA however would like to be consulted at strategic points of the resource planning process.

Secondary & Tertiary Industries

The interests of the vast majority of secondary and tertiary industries in water management are largely represented by the utility service provider, Power Water Corporation. Other industries with additional interests include peri-urban residential developers, whose subdivisions rely on their ability to ‘prove water’ in outlying areas, and the tourism industry, a non-consumptive user of surface water resources. Each is detailed separately below.

⁹ Pers. Comm., NTCA. Large numbers of cattle are finished in Top End paddocks while they await live export. During Ramadan, cattle travel north from Katherine and Central Australia to meet the Indonesian demand for the Eid festival.

The Power Water Corporation (PWC)

PWC is a government owned corporation and the sole supplier and distributor of town water supply, power and sewage services to urban and industrial consumers in the Darwin and Palmerston and rural residents in the Howard area relying on reticulated water supplies. To service the 1.5% increase of daily demand expected over the next 12 month period, the corporation intends to raise Darwin's dam wall by 20%, and is seeking to increase its extraction from its Town Water Supply bores in the Howard East Aquifer by 8%.

The PWC has engineering and remote operations experience. Building on the latter, the Corporation has just funded three full time staff to trial a series of community water planning exercises in several indigenous communities across the Top End. Work has started in Yuelamu, Minyer, Nguui, Gunbalanya and Beswick and proposed planning will have five different outcomes ranging from water source management to water budgeting. The project is still in its infancy and has recently established links with CSIRO.

Power Water is also part of an inter-departmental working group that is chaired by NRETAS that also includes DPI and DRPIFR. The collaboration is aimed at developing synergies that are capable of planning for the growth and development of the Darwin and Palmerston area. There will be a clear need for the participation of the PWC on the HEWAC to support and consult this broader group, and draw upon its expertise.

Initially, it was decided by NRETAS water planners that, in light of the requirement for the water advisory committee to reflect community aspirations, Power Water should not be represented directly on a water advisory committee but rather consulted on an 'as needed' basis. Considering the anticipated contention arising over Power Water's increase in bore water extraction from the Howard East Aquifer, this could assist to deflect conflict away from the internal deliberations of the WAC. This decision however is currently under review by water planners, as PWC have indicated interest in participating in HEWAC, as a representative of the urban, rural and commercial users in the community relying on reticulated water.

In interviews, Power Water noted that it has a good relationship with government and is experienced in planning, however is looking to improve its relationship with local conservation groups, recreational users and community members. It is happy to sit on the HEWAC.

Tourism

Northern Territory Tourism Council (NTTC)

The NTTC promotes and supports the Northern Territory's large tourism industry, and plays a key role in marketing the Territory as a destination in Australia and overseas. As most tourism occurs on Indigenous owned land, the NTTC mediates between tourism operators and Aboriginal Land Councils. It is one of the few stakeholders who holds a strong relationship with these groups, and is likely to grow as more Indigenous groups look for employment alternatives with the recent decommissioning of Community Development and Employment Program. It also holds a good relationship with the NT Parks and Wildlife Commission.

With an increasing interest in promoting high-end 'natural and cultural' tourism in National Parks and Indigenous land holdings, the NTTC has recently recruited an 'Environmental and Sustainability Officer' to help it establish industry level

accreditation and guidelines for tourism operators. The NTTC also intends to lobby for greater access to sites of high conservation value and advocate for environmental protection and management of wetland areas. It is therefore interested in having input into the Water Resources Plan for the Top End, but not direct involvement in the HEWAC.

Government

Department of Defence

The Department of Defence has landholdings within the HEWAPA that rely on bore water and are used periodically for military training purposes. Its personnel are based mainly in Darwin and rely on reticulated water supplied through Power Water.

Defence has a Sustainable Water Management Strategy that will be reviewed in late 2009, and is currently developing a management regime for the use of non-potable water supply across its operations. The key driver for this regime is the *Commonwealth Water Act 2007* to which it is accountable. The Department of Defence is thereby exempt from compliance with State and Territory Acts.¹⁰

While much of its decision making capacity lies in its Canberra offices, the Department has regional energy and sustainability officers whom are responsible for implementing Defence sustainability policies, including a regional sustainable water management strategy. They also conduct regular surface and ground water monitoring programs in many areas, meaning it may have the capacity to provide some expertise to the support broader strategic planning across the Top End. Its interest in the HEWAC is likely to be represented by PWC as a reticulated water user.

Defence appears keen to participate in water resource planning at a strategic level, as illustrated in an interview;

'We are keen to manage water consumption throughout the Defence estate...we have identified several low water efficient facilities in the NT/K [Northern Territory and Katherine] region. ...We are (also) actively involved in a similar planning process for the Murray-Darling Basin with the Department of Environment, Water, Heritage and the Arts, the first priority being the ACT Region.'

Territory and Local government

Northern Territory Department of Planning and Infrastructure (DPI)

DPI is the peak government department for making decisions and eliciting inter-departmental feedback on regional land, transport and infrastructure development proposals. The department is the first stop for development and commercial investment proposals and is responsible for ensuring each complies with the provisions outlined in the *NT Planning Act 2008*. It can seek or provide advice before putting a proposal before a Development Consent Authority. Importantly, the DPI holds autonomy in decision making and can independently choose to accept or reject the advice of NRETAS on proposed developments.

¹⁰ Unpublished interview transcript between Defence Department and Author

When interviewed, a number of government agencies commented that the DPI was a leading agency in government with strong links to other departments and industry. Indeed, the DPI was one of the few agencies with a solid understanding of the growth projections and requirements for metropolitan Darwin and Palmerston. It has a very strong interest in contributing to both the water allocation and resource planning process. Indeed, 90% of its current development applications relate to subdivision proposals in the Litchfield Shire.¹¹

Northern Territory Department of Natural Resources, Environment and the Arts and Sport (NRETAS)

NRETAS' Water Resources Branch is responsible for organising and supporting local Water Advisory Committees as they develop statutory resource and allocation plans. The agency is therefore an important actor in the water allocation planning process and must comply with Commonwealth and NT water legislation and policy.

Engaging in systematic data collection, NRETAS is responsible for mapping and modelling surface and ground water resources, flood forecasting and test drilling sites. It also supports land management and use planning and provide structured comments on the environmental impact of proposed developments. Using its resources and expertise in hydrology, project management and water planning, the agency is also the best informed stakeholder and holds a good relationship with other departments, urban community groups, industry and Power Water.

Recently, NRETAS commissioned a project in Howard Springs to ground truth hydrological models that predict the seasonal and long term trends of groundwater within the Howard East Aquifer. Project officers were employed to support community members wishing to volunteer for the project and monitor their bore water use by using free meters provided by NRETAS. The project has had difficulty in securing community support, due to the common perception that this type of information is a prelude to the government charging for rural bore water consumption. This experience indicates that NRETAS will need to gain more support within peri-urban community to ensure support and legitimacy for plan implementation.

Northern Territory Department of Regional Development, Primary Industries, Fisheries and Resources (DRDPIFR)

The DRDPIFR is responsible for developing, advancing and servicing industry actors within the primary industries, fisheries and mining economic sectors. It produces goods in excess of \$2.3 billion¹², and is well resourced to provide larger players with marketing, research and limited extension services. It has a limited capacity to conduct research but does facilitate industry representation to Federal government.

The department has good planning skills and is well connected to the fishing and mining industries. It has experience in conducting research, drafting proposals, distributing grant funding and disseminating information throughout the industry. It also has a number of project extension officers in its department whom have good links in the community. Recently, it contracted a number of consulting companies to engage 22 individuals in a scenario planning exercise and develop direction for future land use and forward planning.

¹¹ Pers Comm., DPI employee, August 2008.

¹² Department of Primary Industry, Fisheries and Mines 'DIPFM Story: dedicated and geared for growth and demand', 2008

In terms of water planning, the department played an important role in garnering support for the WAP process in Katherine amongst horticultural growers. It commissioned a pre-planning study that determined the needs of water resources for the regional mango industry. Based on this experience, it envisions problems in replicating this study in the Howard Springs area due to the range and diversity of horticulturalists and hobby farmers involved¹³.

It is interested in supporting a strategic water resource planning process and the efforts of the HEWAC.

NT Parks & Wildlife Service (NTPWS)

Situated within NRETAS, the department operates through the objectives outlined in its NT Parks and Conservation Master Plan and manages over 4.7 million hectares across the Territory¹⁴, making it a significant land holder across the Territory.

With a long history of joint management arrangements with Indigenous groups, the Parks & Wildlife Service often has a good relationship with traditional owners of the conservation estate and indigenous ranger groups. To this end, it has the ability to undertake strategic planning for land use and management that delivers environmental, cultural and social outcomes at local and catchment scale levels.

With regard to water, it has capacity to manage for water quality (for instance, weed removal) and contribute to research through the collection of data on surface waters in remote areas. It also has a history of working closely with Landcare, Indigenous and recreational user groups and is often perceived in public as a neutral or an impartial expert. It has attended community meetings in this capacity. NTPWC also reserves the right to comment on land clearing proposals for Department of Planning and Infrastructure.

In interviews the Parks & Wildlife Services states it shares good relationship with Landcare groups, Indigenous Ranger Programs, Traditional Owners, NRETAS, DPI, Fisheries (DRDPIFR), NT Tourism Board, Power Water and the NT Firearms Council. In the HEWAPA, it manages the Howard Springs and Berry Springs Nature Park and has an interest in being consulted during the HEWAC process.

Local Government Association Northern Territory (LGANT)

LGANT is a small organisation is the peak body that supports and services the interests of local government, namely through communication, networking, promotion and service provision. LGANT seeks funds on behalf of its members (for instance, in waste management or road building) and provides advice on managing contract deliverables. It often attends meetings on behalf of local government at a national scale and has strengths in advising government on waste management options.

LGANT members have previous planning experience and a capacity to represent local government on a water advisory committee. As an organisation, it has little

¹³ Pers Comm. DRDPIFR representative. This participant considered that many small scale operations in the Howard East Area have no incentive to engage in industry research focused on water use. His comments illustrated this sentiment further: 'I don't think that the demographic in the Darwin rural area is the same. Many are not in it for the same reasons. I don't think someone at Humpty Doo see themselves as an irrigator I think they see themselves as a lifestyle and the water comes out of that'.

¹⁴ For more information on the management structure of the Parks & Wildlife Service, see URL: <http://www.nt.gov.au/nreta/parks/>

connection to the Howard East Aquifer region and may therefore defer to a Litchfield Shire representative.

Litchfield Shire Council

Situated at the gateway to Litchfield and Kakadu National Parks, the Litchfield Shire has a rapidly growing population due to the recent subdivisions of blocks for rural residential dwellings. Home to over 17 000 residents, the Shire is reasonably large (over 3000 sq kilometres), and is represented by five elected members. Recent local elections have seen popular candidate, Mary Walsh, re-elected as Shire President. The remaining four Councillor positions have been filled by long term local residents.

The Shire Council has lost staff over the past 18 months, mainly due to the amalgamation of 57 community government councils into 8 'Super Shires'. Internal restructuring however has strengthened linkages between the Territory government and the Shire offices and reemphasised the need for community consultation on planning issues.

Litchfield Shire Council members have a history of lobbying the NT government over planning decisions and upholding environmental values. Central to their argument is the need to preserve rural amenity, a value strongly upheld by their constituents. In the past, Council members have advocated strongly for the need for stricter controls on sewage, drainage and the sale of 'wet' blocks (blocks that are in the high water zone during the monsoon season)¹⁵. While admittedly time poor, local members have a strong interest in participating in a local water advisory committee.

Environment Groups

Environmental Centre Northern Territory (ECNT) and the World Wildlife Fund for Nature (WWF)

Both of these groups are Darwin-based, not-for-profit environment groups and share similar viewpoints. The ECNT is the longest established and peak community based environmental NGO with a good capacity for local public outreach. It often partners with WWF to conduct research, support its policy recommendations on water management (see 'Living Rivers Policy') and take advantage of its national networks and outreach. WWF's head office is in Sydney.

The ECNT supports the 'Cool Mob' community project to advocate for sustainable water and energy use in households. Achieving greater water use efficiency in Darwin households is a key component of the project and the impetus for several activities aimed at public education (schools visits, green house open days, supporting community events, newsletters etc). The project also conducts private water and energy audits on behalf of Power Water and for interested members of the public.

The Northern Territory chapter of the WWF is supported through WWF-Australia which is linked to the WWF International Network. Because the majority of Australia's WWF members reside on the east coast, the NT's local outreach may be limited. It is well equipped however to promote local issues on national levels. Currently, it is

¹⁵ Pers Comm., Litchfield Shire Council member (November 2008), also ANU (1998), 'Striving for balanced environmental plan Litchfield Shire', Wild River, S.

focused on securing the adoption of its 'Living Rivers Program'¹⁶ which sets out a framework to protect catchments containing rivers of high conservation value (thus achieving 'Living River' status). A discussion paper outlining the policy was recently released by NRETAS at the Tropical Northern Rivers Future Forum, held at Charles Darwin University in early April 2009.

Both groups have complimentary strengths. While the ECNT has strong relationships with local community groups, the WWF has relationships with AFANT, research agencies, universities and Federal Government. Both groups have the capacity and institutional linkages to undertake independent research or monitoring activities focused on biodiversity or water quality, for example, however lack resources. Each also has the capacity to produce community education materials and host community events around water planning. While both groups have indicated that they are time and resource poor, it is likely that each will support one nomination for membership to a regional water advisory committee.

Greening Australia

Established for over 20 years in the Territory, Greening Australia works in partnership with local government, industry and the communities to advocate and implement a range of initiatives aimed at improving land and water condition. In the Territory, it works with mining companies, pastoralists, urban developers and local government to provide commercial vegetation and environmental services. In the past, it has undertaken large scale revegetation contracts in partnership with Indigenous ranger groups, on behalf of industry.

Greening Australia has recently wound up its "Water for Life" program which built capacity in Indigenous community members to monitor surface water for environmental health. Funded through the Natural Resources Management Board NT, the program has worked with communities in Katherine and the Roper River region and produced various training outputs. Most recently, it has published a 'Top End Water Quality Manual'¹⁷ that outlines the protocols for community based water quality monitoring. A key aim of the project is to ensure collected data is rigorous and able to be incorporated into scientific research and water planning activities. The program will shortly be amalgamated into the larger Tropical Savannas Cooperative Research Centre due to recent funding cuts.

With a good scientific knowledge base, and community planning and education experience, Greening Australia will be a useful organisation to consult for the broader strategic planning for the Top End. Its members currently sit on the Darwin Harbour Advisory Committee (DHAC) group and the Rapid Creek Advisory Committee however the organisation is currently time poor and may be unable to participate in HEWAC meetings.

Recreational User Groups

Amateur Fishermen's Association Northern Territory (AFANT)

AFANT is a well established recreational fishing body of 20 years that represents the interests of its member base to local government, the commercial fishing industry and the broader community. With around 3000 members, the association has a

¹⁶ WWF and ECNT (2006) 'A way forward on developing a Living Rivers program for the Northern Territory'.

¹⁷ Greening Australia (2008) 'Water for Life, Book & Field Manual'.

strong lobby and capacity to advocate for the protection of fish numbers and habitat in government.

Located in suburban Darwin, AFANT employs one full time Executive Officer to operate its day-to-day business, report to members (email and hard copy newsletters), engage the local media and attend meetings. Recently, AFANT received grant money for a series of television advertisements to support its 'Your eyes on the water' campaign, aimed at encouraging members to monitor remote fishing sites and report illegal activities or environmental damage. To support its monitoring effort and lobbying capacity, AFANT has developed good relations with local environmental groups (WWF and ECNT) whom share similar pro-environmental and non-consumptive values for water resources.

AFANT has previous planning experience (from DHAC and the Daly River CRG) and the resources to sit on the HEWAC groups.

NT Field and Game

The NT branch of Field and Game Australia was established in 2000 and has access to four state game reserves to hunt waterfowl. Hunting is a popular sport around the Howard Springs area there are around 1400 hunters hold permits for recreational waterfowl hunting in the year 2007.

The group represents a large recreational group with outreach into the local community. It enjoys good relationships with other recreational user groups, such as AFANT. At the moment, the group relays that it would like to secure a stronger relationship with the Parks & Wildlife Commission to gain access to more hunting areas and potentially engage in management issues, such rubbish collection, weed control and planning.

It has no previous experience in water planning or management but plays an active the environmental monitoring of access areas. Like AFANT, its main concern with the Howard Springs area is likely to be maintaining access for its members, and quality habitat for birds and game.

Community groups

Darwin Harbour Advisory Committee

The DHAC group was appointed by the Minister of Lands and Planning in August 2002, to draft and consult the broader community on a Darwin Harbour Regional Plan of Management. It now is tasked with overseeing the implementation of the Plan and advising government on community views related to the environment, planning and development proposals within the Harbour. A key source of concern for DHAC members has been the lack of statutory backing for the Plan¹⁸.

In the six years since DHAC was formed, it has achieved many of its goals. As well as establishing two ecosystem research and monitoring groups, it has drafted a Stormwater Management Strategy, finalised an archaeological survey of Indigenous sites and identified habitats of high conservation value in the catchment.

Recently the long time Chair of DHAC resigned, claiming publicly that he was frustrated with the group's limited statutory power and the lack of government

¹⁸ See DHAC newsletter, September 2007, from URL:
<http://www.nt.gov.au/nreta/water/dhac/media/pdf/20070904update.pdf>

accountability to responding to advice from the Committee. DHAC members have now elected a new chair and have recommenced quarterly meetings. NRETAS planners have invited them to nominate a representative for the TEERG membership and DHAC is being kept informed of HEWAC progress.

McMinns Lagoon Landcare Group

McMinn's Landcare group represents a concerned, locally based group of residents that look after the McMinns Lagoon Wildlife Reserve, located approximately 30 kms south-east of Darwin. The lagoon is a 'perched' water body, holding water in the dry season and providing important habitat to a number of migratory birds and water fowl. The Lagoon is popular for recreational activities, such as walking, horse riding, picnicking, canoeing and bird watching, providing an important local educational resource.

Receiving funding through the McMinns Lagoon Reserve Management Board, the group regularly hosts working bees and conducts work through small scale funding grants. It has strong capital within its core members, who are long standing residents, however is constantly in need of volunteers. Like other landcare groups, in interviews, it was relayed that the group often depends on one or two core members to do much of the work and therefore is unlikely to get involved in HEWAC or water allocation planning until there are issues under consideration that directly affect the McMinns Lagoon area. As the Power Water Corporation bores lie within the McMinns bore field however, they may prove to be an important group to get involved in water allocation planning.

The group has regular dealings with NRETAS's Landcare Coordinator and is in the process of establishing its profile with the Victorian and national Landcare infrastructure. It regularly works with local funding agencies (for example the Westpac Bank) and local school and scout groups. While time poor, it may put forward a nomination for consideration to the HEWAC however would be more likely to follow mail outs or newsletters.

Holtze Landcare group

The Holtze Landcare group looks after the small water bodies and waterfowl habitat that lie between Robertson Barracks and the Howard Springs Reserve. Currently the area has no clear protection status however its has been acknowledged as a natural drainage channel and valued habitat in a recent Environmental Impact Assessment (EIA) statement by the Department of Defence¹⁹. The Landcare group has recently put together a submission against the rezoning of land adjacent to the Holtze site to 'heavy industrial', giving it some experience in preparing public submissions.

Made up of long time peri-urban residents, its membership has over 20 years of historical knowledge and political experience within the local area. While mainly concerned with local issues around the Howard Springs area, members of the group are well known to local government and have a capacity to participate or contribute to the Howard Springs water allocation planning process. Membership to HEWAC is likely to add to the legitimacy and community participation within the planning process as the group has a good relationship with Charles Darwin University and Gerry Wood, the local Independent member. It should be noted however that the group is not well networked.

¹⁹ Pers Comm., Unpublished interview with Holze Landcare Group member

Girraween Lagoon Landcare Group

The Girraween Landcare Group is made up of residents located around the well-known Girraween Lagoon, located approximately 24 kilometres south east of Darwin. The Lagoon is privately tenured and has subsequently been subdivided into 2 acre 'rural residential' living blocks which are mostly sold. Concern over the impact on its relatively pristine has prompted the group to prepare a well crafted submission statement²⁰ highlighting the potential impacts of development on the social and ecological values of the Lagoon.

Landcare group members live close to the lagoon and typically represent professionals or young families that commute to Darwin. While there is a strong capacity for solid, community input from certain members, the group is currently time and resource poor as many have moved interstate or had children. Members are now struggling to recruit. The group is networked with other Landcare groups and is interested in participating in the HEWAC.

²⁰ Girraween Lagoon: Values, condition, threats and strategies for its sustainable use: A report prepared by the Girraween Landcare Group Inc., August 2007

Measuring stakeholder experience and interest in planning processes

Stakeholders were asked to indicate their level of interest in participating in a water advisory committee and contribute to the initial strategic planning process to develop a regional Water Resources Plan. Responses were transcribed into a scale between 1 – 4, with 1 indicating low stakeholder interest and 4 indicating a high level of interest.

Stakeholders were also asked to detail their organisational experiences with previous water management plans, such as the Katherine/Tindall Water Allocation Plan, the Daly River Management Advisory Committee and the Alice Springs Water Allocation Plan. Planning experiences on more local levels, such as management planning for local lagoons or reserves, were also considered valid. A similar scale was developed to indicate stakeholder planning experiences (i.e. 1 = low, 4 = high).

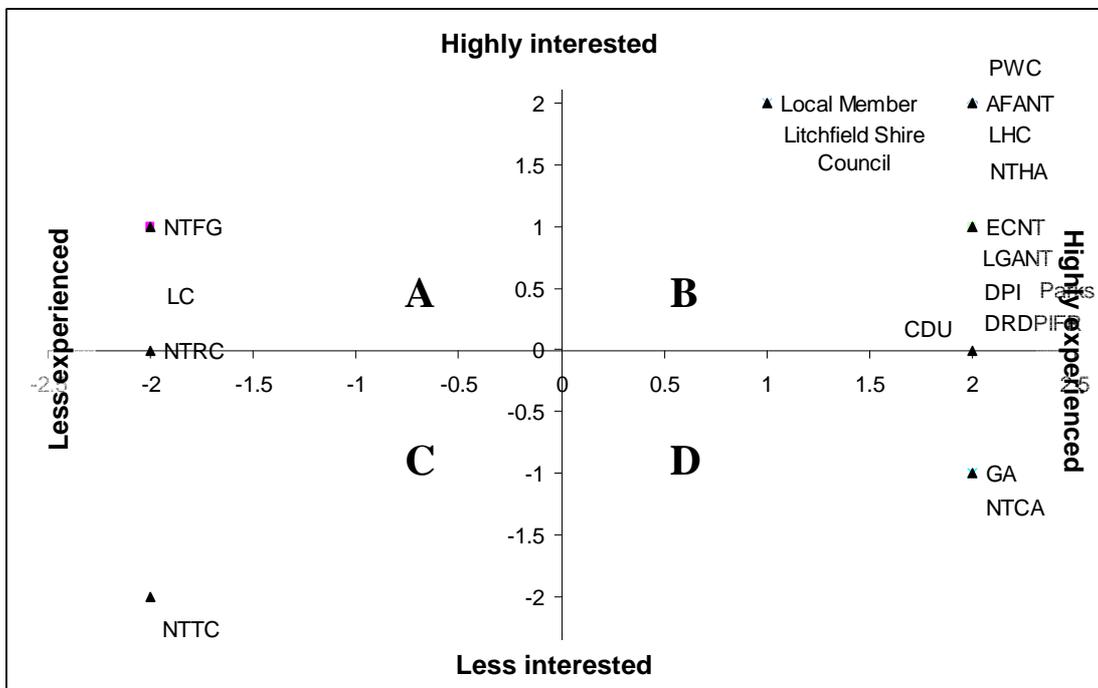


Figure 2: Interest in participating in the HEWAC and previous water planning experience, as expressed by stakeholders

These key to this Figure is represented in the following Table which has grouped the stakeholders by category A, B, C and D, based on the scores given in during interviews.

Table 2: Stakeholder categories and key to the summary of Figure 3

Stakeholder Categories	Description	Stakeholder groups
A	Interested but less experienced	Land care groups (LC)
		NT Field and Game (NTFG)
B	Interested and experienced	NRETAS
		DRDPIFR
		DPI
		Power Water Corporation (PWC)
		NTHA
		Environmental Groups (ECNT/WWF)
		Local Member
		AFANT
		Larrakia Harbour Committee(LHC)
		Litchfield Shire Council
C	Not experienced and not interested	Charles Darwin University
		Parks (and Wildlife Commission)
D	Experienced but less interested	NT Resources Council
		NT Tourism Association
		Greening Australia
		NT Cattlemen's Association

From Figure 2, there are 14 stakeholder groups interested in participating in, or being consulted throughout, the HEWAC planning process. This number may increase as more groups are identified however, this result represents a solid foundation for the selection process.

'Group B' represents the stakeholder groups with more experience in water planning. These groups are most likely to have participated in water planning processes in Katherine, the Daly River or Alice Springs and typically represent long standing, well organised groups able to access a range of resources and information. In interviews, it appears that there are also historic power relationships between these groups, with each likely to have some influence in government departments. For the community and recreational user groups in this grouping, power comes from having a strong membership base that is readily mobilised and an active media engagement strategy. We anticipate that Group B stakeholders will be less likely to find introductory planning tools aimed at inexperienced groups meaningful.

Stakeholders in Group A lack planning experience yet are interested in being represented on the HEWAC. Representing peri-urban residents and recreational user groups, they are important stakeholders for consideration for HEWAC membership. Targeted capacity building to further explain the water allocation planning process and expectations of HEWAC may benefit these groups and help them better determine their capacity to commit to HEWAC. To be effective, this should be done before or during the advertising period for HEWAC membership to ensure these groups have adequate time to put together a nomination for consideration by NRETAS.

Group D represent 'experienced but less interested' groups that may be resource poor or currently have other priorities. NRETAS may need to consider the social or economic incentives needed to encourage these groups to participate in HEWAC.

Group C represents groups that have little experience or interest in participating in HEWAC. In both instances, the key reason cited for a lack of interest was that other groups (currently in Group A) currently represent their interest in water supply and planning. Both groups were happy to follow meeting proceedings through an email list and be consulted on an 'as needed' basis.

In interviews with all stakeholders, it was made clear that some groups may need specialised support, such as administration assistance or more flexible seating arrangements on HEWAC, to facilitate their involvement. Community groups, such as the peri-urban land care groups, are typically time and resource poor and may be better represented in a sub-committee structure that meets locally, on an as-needed basis. If HEWAC support staff can provide regular updates and develop feedback loops that enable groups to have input into issues of interest to them, groups are more likely to buy-in to the planning process and implementation of plans at community levels. These ideas are discussed extensively in the following sections.

Issues over water management in the Howard East Aquifer: Key findings

When involving a multitude of stakeholders in any planning exercise, it is important to understand that each brings different values and expectations to a water advisory committee. The outcomes of decision making can impact on each stakeholder group in a range of ways and often require compromises to be reached. Listening and acknowledging each groups concern is an important first step in any negotiation and encourages stakeholders to commit to a process to achieve consensus as a group.

The following table details the key issues that different stakeholders would like considered in a water planning process. For ease of interpretation, these issues have been grouped to reflect each sector of the Howard Springs community.

Table 3: Key concerns of stakeholder, divided by industry sector

Sector of community	Key Issues
Industrial and commercial concerns	<ul style="list-style-type: none"> • Need for continued access to water resources by stakeholders within the primary industry, mines and fishery sectors to facilitate growth and development (in some sectors, output has doubled since 2006). • Need for accurate and 'fit-for-purpose' licensing that reflects real water use figures by industry – the proposed 5Ml per hectare licenses for commercial users for example, does not accurately reflect resource use and may skew water model. • Tying licences to crop production, so decision making remains with government not grower. • Easier system to make bore meter readings and reporting feasible. • Too little is known about the resource base for planning. More information needed about water resource quantity and subsequent use by industry. • Lack of research into potential water savings to be made by irrigators. Many believe that they are overwatering but cannot afford to experiment themselves. • Need for fair and balanced representation of different sectors of the industry in water allocation planning • Ignorance of ground water systems relationship with GDE's by some industrial stakeholders. • A lack of industry incentives to employ best practice guidelines for bore water use. This is coupled with a lack of extension services or research support to produce high quality information to inform decision making about water resource management • There is a wide spread fear that access to water will be increasingly restricted and affect future economic activity. In the mining

	<p>industry for instance, there are many exploration leases yet proposals for future development have yet to be written. In pastoralist sector, there is a fear of restricted access to floodplain area and bore water for finishing large numbers of cattle in preparation for live export. Cattle numbers are expected to increase.</p> <ul style="list-style-type: none"> • Maintaining and expanding access to high quality tourism sites (areas of high cultural and ecological significance) to capture high end tourism market.
Environmental concerns	<ul style="list-style-type: none"> • A lack of a strategic resource plan for the Northern Territory, coupled with a lack of protection status of key GDE sites. • Frustration with current environmental policies for lack of community buy-in, institutional framework or long-term vision. • Minimising harmful practices around waterways to reduce weeds, pests, pollution runoff and over-extraction of water. • Fear that new housing developments will remove 'green' corridors between lagoon system and fragment landscape. • Need for holistic 'whole of catchment' management approach for waterways to preserve water quality and biodiversity. Integrated catchment management plans need to be developed for Top End river systems, with special interest noted for the Mary River wetland areas, Litchfield National Park and Berry Springs Nature Reserve. • Ensuring sand mining occurs in appropriate areas with annual recharge (Adelaide River). • Maintenance of water levels in lagoon which are reportedly in decline due to the overdrawing of bores in Howard & Berry Springs areas. • Drawdown may increase incidence of fire in wetlands, swamps and monsoon rainforest endangering rare species. • Urban and industrial development is encroaching into high conservation areas and farmland, "blurring the line between urban and rural water policy practice". • Poor signalling in current market place leading to little incentives for consumers or industry to save water.
Research Agency concerns	<ul style="list-style-type: none"> • Research and participation fatigue in targeted communities due to inconsistent funding and lack of feedback from current research.
Indigenous interests	<ul style="list-style-type: none"> • Loss of traditional ecological knowledge. • Depletion of traditional resources, such as dugongs, fish, turtles and woody plants. • Maintenance of customary, cultural and environmental assets for traditional owners wanting access to country. • Management of cattle, feral pigs, cane toads and weeds in wetland systems. • Over extraction of water in lagoons and wetlands is reducing habitat and water quality. • Need for rehabilitation after mining extraction (particularly sand mining in the Howard River area).

Rural residential issues	<ul style="list-style-type: none"> • Lack of reserve status for local areas of high conservation value, leading to its inappropriate use by visitors, quad bikes, shooters, campers leaving large amounts of rubbish etc. • Potential over pumping of bores from Power Water and lack of publicly available information. Community feel that PW pumping has increased to compensate for urban growth at expense of rural population. • Community fear that Power Water extraction is affecting rural residential bores and GDE's through the lowering of the water table. • There is a widespread belief that the government wants to make rural residents pay for their bore water use. • Over development of area with a lack of community consultation. Some Landcare groups are seeing negative effects in lagoons due to changed patterns of runoff from roads and drainage channels. • Frustration with the government's attitude to public consultation and decision making. There is a lack of recognition or consultation by government on planning decisions around new housing developments. • Poor policy on septic tanks and bores in Howard Springs area. • Lack of demand management for water management or a focus on urban consumption patterns. • Frustration with the continued stalling of new dam construction from government and Power Water. • Lack of regard for historical efforts in water management, 'today's leaders are trying to reinvent the wheel' despite going through the same process years ago'. • Increasing cane toad and weed infestation.
Broader community & recreational issues	<ul style="list-style-type: none"> • Recent growth in tourism and commercial fishing is affecting fish numbers. Recreational fishermen claim a need to review fish catches and possession limits. • Industrial and residential developments planned around key breeding areas and nurseries may be impacting fish and bird populations. • Decline in numbers of volunteers to keep community groups going. Community residents are increasingly time poor. • Need to appropriate zoning in recreational areas to accommodate specific activities e.g. bird watching, horse-riding, motorcycles, hunting etc • Groups are worried about water quality flowing into and out of areas of high social or cultural value. • Noxious weeds affecting waterfowl and fish populations. • Access to hunting areas – special interest in Shoal Bay Coastal Reserve, Howard Swamp/Hunting Reserve, Lambell's Lagoon and Harrison Dam. • Lack of manpower or enforcement in reserves leading to increases in unregulated hunting and crowding of sites (implications for safety), despite their protection status.

Territory government	<ul style="list-style-type: none"> • Need to comply with National Water Initiative agreement to undertake water allocation planning. • Water is currently the biggest limitation to peri-urban and industrial development. Developers are putting significant pressure on DPI to release land. • Securing sustainable water supply for future industrial and urban growth. • Addressing mistrust and frustration with Territorian government by peri-urban community. • Lifting restriction on further bore extraction in Howard East aquifer through water allocation planning process. • Addressing misconception in peri-urban/rural community that Power Water and government are excessive water users. • Building capacity of community which has limited knowledge of ground and surface water interactions.
Local Government	<ul style="list-style-type: none"> • Preservation of rural amenity for peri urban/rural voters. • Appropriate and sustainable use of water to facilitate future growth, development and long-term viability of rural communities. • Sewage disposal in Coolalinga and Noonamar which has no access a town sewer, limiting development options. • Lack of reticulated water supply for rural residents on low yielding sites. • Little information or resources to determine the conservation value of local areas. • Representation of local government on HEWAC.

Delving deeper: prioritising issues of concern amongst stakeholders

A number of concerns and issues were raised and discussed repeatedly by different stakeholder groups, indicating that these were of high concern to the Howard Springs community. These are represented in the left hand column of the following table, along with the number and type of stakeholder group raising them on the right.

Quotes illustrating the spectrum of opinions around each issue are presented and discussed in the section to follow.

Table 4: Key issues raised by stakeholders in the Howard East

Key Issue raised by stakeholders	Number of stakeholders raising issue	Type of stakeholder group
A wide spread lack of understanding of groundwater systems and related pressures, and a lack of confidence in the science underpinning decision making	8	Commercial water users, Local Shire Councils, Government Departments, Community groups, Environmental Groups, Power Water, Research Agencies & NT Horticultural Association
Concern about the environmental, social and economic trade-offs involved to meet current and future urban and rural water needs	8	Power Water, Local government Depts., Shire Councils, Development Consent Authority, Environmental groups, NT Horticultural Association, Rural residents and Community groups
Lack of confidence or trust of government driven planning and decision making processes	6	Development Consent Authority, Community and residential groups, Environmental groups, NT Horticultural Association, Greening Australia DHAC representatives, Industry and Commercial
Concern around licensing procedures, rules and potential caps on water use for commercial licenses and developers	7	Development Consent Authority, NT Resources Council, NT Horticultural Association, Shire Councils, Government representatives, NT Resources Council, NT Cattlemen's Association
A lack of social, economic or environmental incentives to save water or manage demand for water.	8	Environmental Groups, Local Council members, Government Depts., Community groups, Environmental Groups, Power Water, Research Agencies, NT Horticultural Association
The current lack of a strategic planning framework and Territory Water Plan, and the lack of protection of community environmental assets.	6	Local Council members, Government Depts., Environmental Groups, Recreational User groups Community groups, Research Agencies

Discussion of key issues affecting stakeholders in the Howard East

These issues are discussed below using relevant quotes from stakeholder interviews that demonstrate the diversity of opinions held within the broader community. The use of key quotes illustrates the potential impacts that decision making may have on different stakeholders within the community.

1. A wide spread lack of understanding of groundwater systems and related pressures, and a lack of confidence in the science underpinning decision making

This issue affects all stakeholders. In interviews most acknowledged a lack of solid understanding about the Dolomite aquifer system and its connectivity with surface water and ground water dependent ecosystems (GDEs). Community interest in learning about groundwater systems differed from stakeholder to stakeholder, often depending on an individual's judgement of the health of the GDEs. Many pointed to the common perception of an endless water supply delivered every monsoon as a major barrier that would need to be addressed before engaging the community in planning. Others pointed to a perceived lack of quality information or a lack of faith in the groundwater models underpinning resource decisions:

“The public perception is that ‘we can just build another dam’ it is not that simple.” (Power Water Corporation)

‘There is a lot of mythology about and virtually no evidence to debunk it or otherwise...’(CDU representative)

“The understanding of the resource is extremely poor. There’s a lot of money going into community consultation and regulatory services but the things that underpin that, is the research on how much water is available for use and hydrology, are going down. I mean what my water use is, and what the value of the resource is – we are very poor in those areas” (Commercial water user)

Others, including participants from government and commercial sectors, pointed to a widespread community distrust of hydrological models used for government decision making. Comments illustrating these points are in the following quotes:

“I think one of the big issues that the authorities have to face is the fact that no one believes any of the recharge rates or the possible quantities of water available for use. Because they don’t believe the science is there.” (Litchfield Shire resident)

Others referred to a lack of understanding of water systems at a catchment level:

“We need to look at systems holistically and the ‘big picture’ so we understand the relationships between issues.” (Environmental group)

“There isn’t much understanding of the impact of the catchment on the harbour and what it could be in the future through fresh water runoff nutrients and sediments. That’s something that there needs to be briefings and involvement of community people in coming to terms with” (CDU representative)

The perception of endless water supplies, coupled with a lack of knowledge about groundwater viability has led some investors to invest poorly and lose their capital investment. In interviews, stories were relayed detailing how investors had purchased land for subdivision or commercial use before checking the viability of the

underground aquifer. This can cost both the investor and the environment, as pointed out by a horticultural industry representative:

“We have cleared large areas of land just to find that the required water resources weren’t there...many people don’t understand... and bring southern perspectives of temperate soils with lots of clay. Even locals who have been dealing with [tropical] soils for 30 years have trouble. We have some of the highest evaporation rates in the country...” (Horticulturalist)

“Currently the EPA has put holds on two subdivisions and they have to prove water. Holds are being put on developers by NRETAS and we are even getting into discussions about using tank water as a water supply...” (Development Consent Authority Member)

Other participants noted that there seemed to be confusion about water supplies, even within different government departments, and that this confusion was also affecting development decisions.

“...You go to a...meeting and someone from the government will stand up and make these statements “We’ve got no water.” It’s not what Power Water are saying. This is where we are at. It’s an unknown science. There’s conflict between power ... You wonder why people having a go at the system because if they ask the question another day, they will get another answer...that’s where the real confusion is.”(Litchfield Shire Resident)

The perceived lack of available science and quantification of water resources affected some industry stakeholders. They argued against introducing a regulatory environment until the ground water models had been validated. As put by two stakeholders in the horticultural industry:

“It’s about managing a resource. And we have to understand the resource to be able to do that. We are going to get into all these arguments in these water user groups that will have no basis. Because the environmentalists will say, well I think we need to do this, and the farmers will say, we need to do this. And it’s all somebody’s opinion and it’s very poorly grounded.” (Commercial scale grower)

“It’s because the science isn’t there on a broad scale, its trial and error! There would be hell to pay if you’re guys start issuing licences without any broad science explaining why you are setting the levels at whatever you are setting them at.”(Cut flower grower)

Interestingly, NRETAS recently commissioned a voluntary Bore Metering project in the Daly River region and Howard Springs in an attempt to collect accurate data to ground truth its ground water models²¹. The project was launched through a number of public meetings and initially resulted in the identification of 194 volunteers. After an initial suitability assessment, volunteers with suitable bores were asked to sign a simple contract (dealing with access, indemnities and reporting) with the Department before meter installation. A large number (50+) of volunteers declined to sign the contract or did not return the contracts which left the number of suitable meters with

²¹ NWC-funded project: Sustainable development and management of water resources in Northern Australia: a model approach, NRETAS Bore Metering Update, November 2008, Draft.

owners' signing contracts at just over 100. Most volunteers had smaller bores, due to a low response rate from commercial level users.

2. Concern about the environmental, social and economic trade-offs involved to meet current and future urban and rural water needs

This issue was often raised in interviews with Litchfield Shire residents who were dependent on self-funded bores for stock and domestic use. The rights of Power Water Corporation to extract more water for Darwin's urban water supply from the two additional bores in the Mc Minns Lagoon area, was seen as a potential threat, as conveyed in the comments below.

"Concerns about water from a lot of people are the immediate use by Power Water. People raise this constantly, every time they are having problems with their bores, everything is attributed to Power Water. They don't look at their neighbour who might be pumping all day; it's always that the Howard bore field is having an impact."(Local Council member)

"If you put the Howard Springs on an agenda it will get people in. When Power Water came out they say 'Well we are drawing only part of our licence'. People then get frightened because they think 'well my bores not to good now, how's it going to be when they draw more water'." (Litchfield Shire resident)

"Water is our lifeline here and they have talked for years about dams and they are not going to do anything with it. Where are they? Why aren't the dams here? Why hasn't work started?"(Litchfield Shire resident)

3. Lack of confidence or trust of government driven planning and decision making processes

The recent growth of Darwin's economy and population has prompted large scale subdivisions for rural residential housing along the Stuart Highway and around the natural drainage systems (lagoons) of the Howard River. This trend will continue as the majority of development proposals continue to affect the Litchfield and Bachelor Shire areas.

The recent subdivisions and development have raised concerns amongst residential and environmental stakeholder groups who felt under-consulted in planning processes. Some Landcare groups or concerned residents had put together submissions for the government opposing development and relayed concern about the efficacy behind development decision making;

"We worry about people doing subdivision maps without actually going out on the ground in the wet season to see where the water mark is because it doesn't look like a riparian zone in the dry. In lots of places there's a foot of water over the ground and it's sold to somebody as a house." (Litchfield Shire Resident)

"You wonder why people are having a go at the planning system because if they try to do the right thing and ask the question another day, they will get another answer...that's where the real confusion is." (Development Consent Authority member)

Most residents are concerned about the impact of housing developments on ground water dependent ecosystems in peri-urban lagoons, spring fed rainforests and key fishing areas. While there is no scientific evidence to support the contention,

Landcare groups and residents believe that the advent of new drainage channels and roads was diverting natural run off into lagoon systems and affecting the natural seepage rates of water back into the groundwater aquifer. This is outlined in the statements below:

“What concerns me about all the wetlands around here...are all our little creeks and waterways going to end up like concrete drains?”(Litchfield Shire resident)

“Unfortunately, the current ‘post-rehabilitation’ state...does not give the Landcare Group much confidence that drainage for this development will be dealt with in an environmentally sensitive manner.”(Girraween Landcare Group Submission 2007)

4. Concern around licensing procedures, rules and potential caps for commercial users and developers

This issue mainly affected the commercial sector that would be affected by licensing. In the Howard East area this predominately involves horticulturalists, being mango and exotic fruit farmers, mixed farm enterprises and Asian vegetable growers. All commercial growers interviewed for this research were in favour of licensing, seeing it as a way to secure their investment.

“From my perspective the need to have a water allocation plan is paramount and until we get that sorted out it’s a real issue for the industry. I don’t think producers know it but they need to have that certainty. Across the territory not having the licensing sorted out leaves people a bit hesitant to invest so they need to know what they’ve got and what they about to have and what the rules of the game are.”(Government representative)

Some larger horticulturalist raised a number of questions about the conditions of their water licences for consideration by NRETAS water planners.

“We all should be metering our bores and we should all be providing data. I agree with it but the practical legalities, we have half a dozen bores and one the first of the month, I have to go around and read all the bores. That’s always a pain.” (Commercial water user)

One leading horticulturalists considered that the 5 ML licence granted too much water for some growers, and would potentially limit development of the industry. The quote below explains their point:

“I mean this figure of 5 mega litres. How can you have a water allocation plan based on that? First of all, your going to give me more water than I need and two, they will say that there is only going to be so much horticulture over there and use that as a planning basis. There could actually be five times the amount of horticulture over there.” (Commercial grower)

This grower went further:

“Is a licence tied to a crop or a block of land? What happens if I want to grow a different crop? How does a licence account for changes in the cropping patterns? Otherwise, give me a licence for 5 Ml/ha and I’ll worry about what I grow.” (Commercial water user)

Others worried about enforcing licences and the effects on the subdivisions planned for Litchfield Shire

“There’s going to be big issues with policing. If you’re not going to enforce the law then you shouldn’t make it in the first place.” (Litchfield Shire resident)

“How you are going to do it will be a big issue. What are you going to do with a block that hasn’t been developed? Will you give them the same licence as I use (ed. participant has been in business for over 20 years)? Obviously you have to. If you consider a place like Marakai where it is all subdivided up, there is not a lot of water over there because they do not have a very good aquifer. 90% aren’t developed so if you want to allocate water for all those blocks, you are going to have minimum allocation for the ones that aren’t using any water. That’s going to be a political problem” (Litchfield Shire Resident)

5. A lack of social, economic or environmental imperative to save water or manage demand for water.

Fostering a ‘culture of sustainability’ amongst water consumers was considered important by urban based environmental groups, community groups and some commercial stakeholders. However, subsequent policy would need to counter a lack of economic incentives to save water in peri urban areas. For many, the high usage of potable water for domestic purposes, namely in maintaining tropical gardens in the dry season, was viewed a source of frustration. As put by several interview participants:

“Its really about people engaging and having a trigger to engage because at the moment people I think don’t see water as being (limited)... there needs to be enough message that this isn’t going to be utopia forever”

“You need somebody somewhere along the line to say ‘to water a garden on a 5 acre block you need X.’ and give that to everybody. (But) What happens when it doesn’t add up and you realise you don’t have that much water? What happens when there are new subdivisions?” (Litchfield Shire resident)

“It seems fine to use perfectly good water from a tropical river on a lawn’, we should be recycling waste water for watering parks and gardens, as well as selling it to industry”

“I can’t understand, down south you see what they do with treated sewage down south and...recycled water features. I’m really disappointed in that, I read about that sewage outfall problem before I joined council. People wouldn’t believe me when I told them.” (Litchfield Shire Council member)

6. A lack of a strategic planning framework or manpower to enforce rules and regulations to protect areas of cultural or ecological significance.

According to some stakeholders, the lack of a strategic Water Resources Plan for the Northern Territory was leading to the degradation or lack of protection of sites of high ecological significance. These stakeholders were keen to engage in a strategic planning exercise that would result in a number of long term objectives that planned for the protection of groundwater dependent ecosystems for future generations. Others referred to a perceived lack of manpower to enforce rules around the recreational use of local lagoons and rivers, despite their protected status. Comments included:

“Considering the current 80/20 ruling, we are hamstrung by poor policy, 20/80 rule was never actually signed off on by Cabinet as far as we are aware. The rule is open to interpretation and can lead to a lot of water being extracted. It has led to a lot of development without adequate EIS (Environmental Impact Statement), but is much better than the MDB (Murray Darling Basin). We need a living rivers policy that protects aquifers from over allocation.”(Environmental group representative)

“Darwin is becoming like other cities that simply reach out further and dam the next river”(Environmental group representative)

“We have pristine environments in the territory and I think we should be looking a lot more closely at developing it well. At the moment, they are not looking at the long term, instead it’s all about putting the territory on the map.”(Community group)

These point will need to be considered for before stakeholders are asked to participate in a planning process, however represent concerns placed at a strategic level and therefore not necessarily directly relevant to the HEWAC.

Issues raised by Howard Springs residents in other CSIRO workshops

The issues outlined above build on recent work done by CSIRO²² in the Howard Springs area. Two workshops were held at CSIRO’s offices in Darwin in 2008, aimed at defining the range of values that different stakeholders attribute to regional water resources, and to trial decision support tools to explore options for settling trade-offs between competing outcomes. Attended by representatives of local Landcare groups, recreational fishing/hunting groups and indigenous interests, participants were asked to develop and weight specific criteria that reflected their ideals for water management. The results informed a subsequent multi-criteria analysis and a citizen’s jury exercise undertaken in the second workshop.

In workshops, the criterions (or issues) that were determined to be most and least important are represented below.

Table 5: Issues deemed important by Howard Springs stakeholders in CSIRO workshops (Source: Woodward et al 2008)

		Howard Springs Workshop Results ²³
Issues/Criteria considered most important		<ol style="list-style-type: none"> 1. Condition of aquatic habitat and populations of aquatic species; 2. New industry in the catchment; 3. Risks to water quality; and 4. Condition of terrestrial habitat and populations of terrestrial species.
Issues/Criteria of least		<ol style="list-style-type: none"> 1. Gross value of Primary Industries production

²² See project ‘Howard River environmental flows and social values: A project to support water planning in the Howard River Catchment, 2008.

²³ After the citizen’s jury exercise undertaken in the second workshop, participants weighted the selected criteria differently indicating that their values or thinking had changed. These results have implications for the tools to be selected for this project and are discussed in the following section.

importance	<p>in the catchment;</p> <ol style="list-style-type: none"> 2. Extent of new commercial/retail businesses; 3. Crowding at favourite sites; and 4. A tie between: Number of motorbikes and quad bikes, ML of water pumped from residential bores/year, and Number of times per dry season that stock and domestic bores 'fail'.
Issues that elicited most diversity of opinion	<ol style="list-style-type: none"> 1. Number of times per dry season that stock and domestic bores 'fail' 2. Risks to water quality 3. Number of sites accessible for hunting, fishing and shooting 4. A tie between: Openness of consultation and planning process and New industry in the catchment

NB: It should be noted however that, despite the best efforts of the research team, there was no industry or commercial users represented at either workshop.

Issues of most concern

Issues that were given most weighting in the multi-criteria assessment (and therefore considered most important) related mainly to the risk of commercial and residential development on water quality and areas of high conservation, cultural and recreation value. Discussed at length in the citizen's jury exercise held in the second workshop, stakeholders noted the impacts of new development on their perception of rural amenity and aesthetics. They also noted the fragmentation of landscapes and subdivision of wetlands, and the subsequent impact upon their enjoyment of these areas through the restriction of access to hunting areas, and a decline in water quality and habitat.

The citizen's jury exercise also centred discussion on PowerWater's extraction of Howard East water for urban town supply. Workshop participants that were rural-based believed that the needs of locals living and working around Howard Springs should take priority over fulfilling the urban demand of Darwin. Further, participants expressed distrust in Power Water's reported extraction rates from bore fields.

Importantly, as the exercise progressed and participants were given more access to information, the depth of expressed concern about this issue shifted. Participants were encouraged to ask questions to the Water Utility Services Manager of Power Water and discuss current rates of rural and urban consumption and the critical role of the bore fields in Darwin's future supply strategy. People acknowledged that Darwin's water consumption was significantly higher than other capital cities, largely due to the perception of endless water supplies caused by the monsoon. By the end of the workshop, participants were able to engage in discussions around demand management strategies and seasonal trends, with one participant commenting "*I think we all have to take responsibility for the water we are using. Power and Water are only using 16%*"²⁴

²⁴ Straton., et al (2008: 28) 'Evaluating scenarios for the Howard River catchment in the NT: Summary report for workshop participants and stakeholders'.

Linkages were also made between the recent increase in number of residential bores, and the potential impact or risks to groundwater quantity and quality. Unregulated demand from local horticultural use (50% of demand²⁵) and stock and domestic bores (30%) was thought have the potential to reduce the amount of surface flow and affect areas of high recreation value²⁶. Importantly, when observing this discussion, it became apparent that people made a distinction between demands from horticultural (commercial) and residential bore demand, with the later being viewed as more acceptable (see table above).

Development proposals were discussed by the group who concluded that the development of all blocks to their full capacity may lead to a system collapse. One participant said *“We can’t keep subdividing as we have in the past²⁷”*, while others stressed the need for more research to determine the health of the aquifer and how the hydrological system works. According to one participant, *“We don’t have the information for making decisions – what is the capacity of the aquifer to provide more water?”* (Woodward et al 2008)

The potential impact of septic tanks on water quality was also discussed and, after much debate, the group decided that there was a clear need for greater coordination between land and water use planning. Again, concerns about further development and potential rezoning of areas to accommodate more development surfaced, leading participants to agree on the importance of openness and community consultation in planning processes.

One key observation is that it became clear that stakeholders would be unlikely to accept or support trade offs that would detrimentally impact upon areas prized for recreational value. This could potentially reflect the recognised bias within the group, which did not have representatives from the commercial sectors, nor developers however offers insight for future water planning processes.

Finally, all enjoyed participating in the workshops and gained new knowledge and an appreciation for the complexity of water planning. Most importantly, participants relayed that they now felt a sense of responsibility to manage water wisely.

Issues of least or mixed concern

Participants were least concerned about the value of current development or the amounts of water (ML) being pumped from residential bores. Interestingly, participants were also least concerned about the tendency of residential bores to ‘fail’ indicating that they are not currently experiencing problems with their own bores. If participant’s bores had failed recently, the expense of sourcing alternate sources of water would likely have caused that participant to rank the issue of greatest concern. It also indicates that the connectivity between surface and ground water is not well understood and people were not making the connection between over extraction and surface flow into high value areas.

A number of issues also generated a range of opinions within the group, indicating that they might be of interest to specific stakeholders. Listed above, these issues

²⁵ NRETAS (2008), Groundwater in Darwin Rural Area: A PowerPoint presentation, Water Resources Branch, Land and Water Division, Palmerston

²⁶ Some of the values noted by these participants for this area included fishing, swimming, hunting, bird watching and passive bushwalking.

²⁷ Ibid

match closely with concerns found during the course of this stakeholder analysis and include the need for an open planning and consultation process.

Main themes to emerge from stakeholder key issues analysis

A number of common themes emerged from the issues raised by stakeholders. These were thought to be inextricably linked and useful for informing the development and delivery of 'fit-for-purpose' planning tools or activities for Howard East stakeholders. When considered together, they form the beginning of a community engagement strategy that aims to inform stakeholders, enhance legitimacy in government planning processes and increase stakeholder and community willingness to seek solutions around contentious issues.

1. There is a wide spread **lack of understanding** within the broader community of how ground water systems work, how much water is available for use and what residential and commercial water requirements are, and what is needed to keep groundwater dependent ecosystems healthy. Despite considerable effort from government officials and PowerWater to explain scientific models, some stakeholders expressed scepticism in the validity of government groundwater models, advocating for the need for more research before water planning can begin. The latter sentiment is linked to the next point.

2. There is a strong **need for trust** to be built between the broader community and government agencies. Currently, stakeholders are wary of being involved in planning or projects that are government driven, which is evident in the lack of responsiveness to NRETAS voluntary bore metering project. Stakeholders will be seeking assurances that their participation and input into planning will be regarded and useful.

3. Lastly, options need to be developed to enable a range of stakeholders to come together to **make informed decisions about tradeoffs** involved around meeting current urban and rural residential water needs. This issue, among many, is contentious in rural areas however can be partially addressed through an engagement strategy that builds understanding and trust into the planning process

While other issues, such as the need to protect community environmental assets, the lack of a Territory level strategic plan and the low incentives to save water are raised by stakeholders as key issues, these can be partially or wholly addressed through the water planning process. Getting Howard East stakeholders to buy into the planning process (earning their trust) and empowering them to make informed decisions (through community education) are considered to be the most important first steps where planning tools can assist. Resolving disputes over resource use and reconciling different values over water resources, while an integral part of the planning process, can only first be addressed through educating stakeholders to make informed decisions.

Stakeholder Knowledge Gaps: Areas of interest to stakeholders

In interviews, stakeholders were referred to a checklist with a number of water planning topics outlined and indicate or add the specific areas they would like more information. The results are hoped to inform future information sessions and ensure that the development of educational tools and 'fit-for-purpose' and tailored to stakeholder interests.

The topics given covered were listed under three broad categories being; institutional arrangements for water, technical information and regional information. Based on 30

responses (out of total of 40 interviewed), the percentage of stakeholders interested in each topic are detailed in the graph presented below.

Overwhelmingly, stakeholders indicated a strong interest in receiving information on a regional level. This category attracted more responses (<60% of stakeholders) with most groups requesting information about the following topics:

- Water trading
- Current water use in the region
- Requirements of existing water users
- Future water demands of the region
- Future requirements for indigenous owners

Interestingly, the last two topics attracted the most interest among stakeholders, being 'future water demands of the region', and 'future requirements for indigenous owners' (<70%).

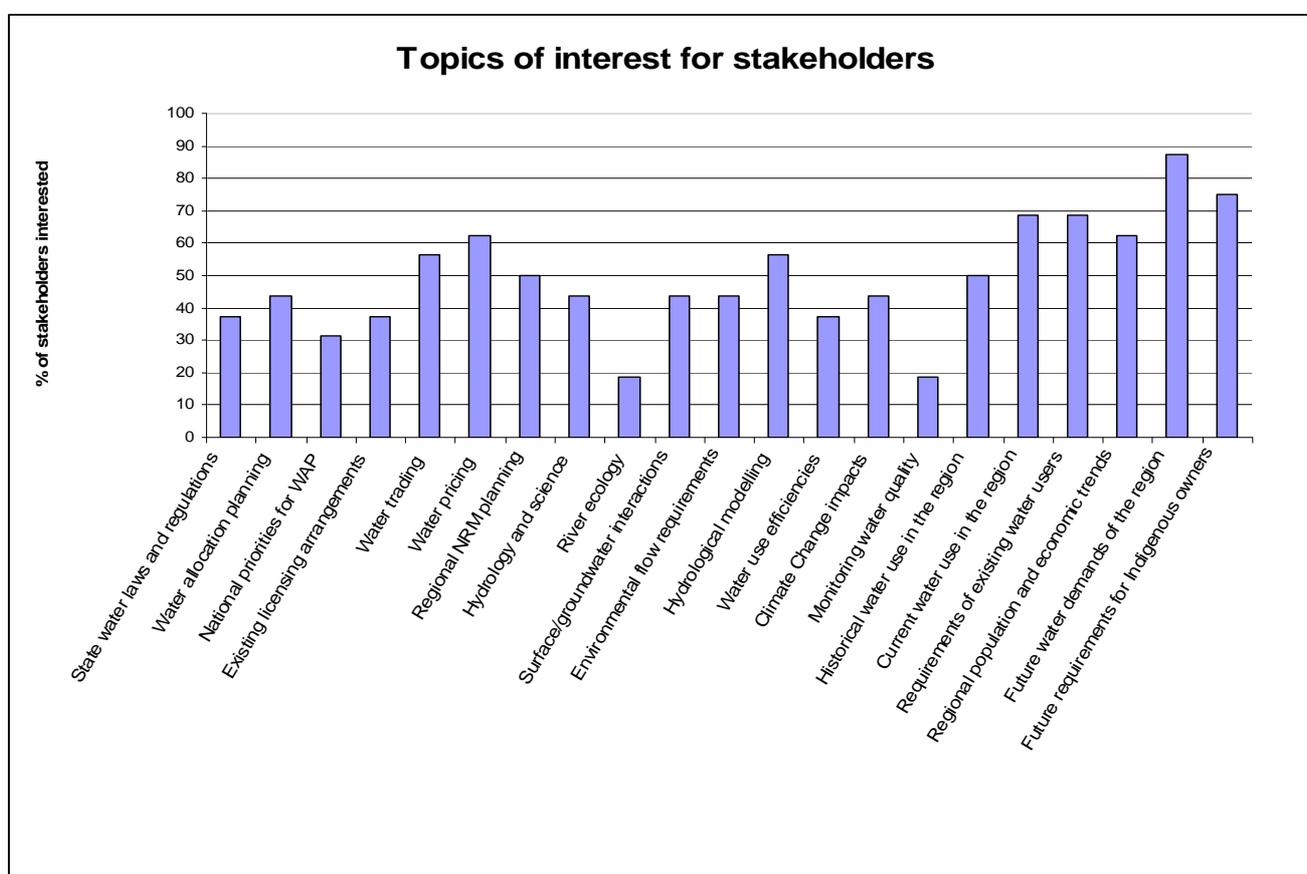


Figure 3: Topics of interest to stakeholders (Source: Authors interviews)

Stakeholder Needs Assessment

In interviews, it was made clear that different stakeholder groups have a range of expectations, needs and capability to meaningfully contribute to water planning processes. Stakeholder needs were determined by asking interview participants to reflect on their previous planning experiences and identify any key factors that influenced their ability to participate in a decision making process. Representatives

were also asked to consider their capacity to participate in a planning process considering their current resources and time commitments. This feedback provides a basic guide of enablers and barriers for engaging stakeholders in water allocation planning.

Adequate provision of resources

Interviews with DHAC members and their support staff indicate that, despite good intentions, members are often time and resource poor and rely entirely on support staff supplied through NRETAS. Meetings are held every second month, and a busy agenda often left little time for questions or discussion. Timely and meaningful participation often came down to a member's ability to keep informed and educate themselves between meetings: Some relayed that this undermined the effectiveness of the group and its subsequent outputs:

*“A lot of it depends on the time that the chair and the time DHAC members have...without factoring in more resources, we can't do anything [in HEWAC].”
(Government representative)*

This sentiment is reiterated by supporting staff members for DHAC:

*“The workload for supporting DHAC and undertaking associated project work to a high level of competency is often too much for one FT position. Working it through with NRETA, it turns into a 1.2 position when averaged out.”
(Government representative)*

Effective modes of communication

During interviews, stakeholders were asked to identify the forms of communication that worked for their group. The following strategies were suggested by participants and current DHAC support staff to improve communication between water planners, researchers, the WAC group and broader community:

- Information sessions and HEWAC member training to build capacity around regional hydrology and the effects of current and future water use, enabling more informed group discussions and outputs
- Distribution of newsletters and meeting minutes in electronic form and/or hardcopy with an appropriate response period – particularly suited to community groups with stretched time and resources
- Uploading documents and project documentation on dedicated websites and internet portholes – more rural, remote and peri-urban stakeholders are online, for instance 90% of NTHA and NTCA members
- Using television advertisements to get take home messages across the broader community – this is used by both AFANT and Cool Mob have good success with television advertising to deliver key take home messages to a wide audience
- Using commentary and talkback radio shows on popular programs such as ABC Rural Country Hour, Territory FM, etc. to generate community discussion
- Using support staff and HEWAC Chair to update subcommittee groups via emails, phone calls and attendance at community meetings

Finding the right person to represent information to the public was also considered important:

“Word has to get out on the ABC and commercial radio. Not just an advertisement but people actually discussing it. You need a communicator, rather than a person who just makes some noise. The people who do the modelling are not necessarily the right people to go into a community.”(Recreational user group representative)

Some stakeholders cautioned that timeliness was a crucial factor and could make or break a planned activity. As put by one DHAC member:

“One of the criticisms of DHAC I hear, is that people say – well we advertised for three months we went out there and nobody showed up. One the other side I hear people wanted to go but couldn’t get there for that time. If its not high profile it will slip through the cracks.”(DHAC representative)

Building group capacity and keeping people informed

Having confidence in the science behind NRETAS’ hydrological model is important, as noted by one stakeholder when reflecting on their experiences in KWAC:

“[Some stakeholders]...really came along with the process...they were educated as they went. Once they understood, people accepted the validity of the model and had faith in its science. Modellers need to be confident in their estimates of water.” (NTHA representative)

Involving community committees in research and monitoring efforts was considered important. DHAC received funding in the past to develop a research and monitoring component which continues largely through the efforts of CDU. This helped members to deepen their understanding of technical issues and subsequently provide better advice for the Ministers office.

“We got a couple of hundred thousand dollars a year for a number of years to do little research projects. I think these were very helpful and allowed us to focus on a couple of topics of interest...[T]hey have done some really good stuff at pulling things together and providing advice for monitoring systems.” (NTHA representative)

It was also important to be prepared for planning, particularly for different industry stakeholders. When preparing for participation in the Katherine-Tindal WAP, some industry stakeholders commissioned a survey:

“We did an exercise, we knew the plan was coming up and the industry was very concerned about it. We funded a guy to do a survey of crop water use for the horticulture sector of Katherine and what it meant for the industry association. We got the data we needed to have the conversation...It got them [the growers] thinking about how much water they were using” (NTHA representative)

When discussing the benefits of workshops, one industry representative commented:

“We have had some workshop sessions with a broad range of participants – from small to large growers and government. It was good as it allowed farmers to give their input and take ownership because it was finally put to them in their language.” (Grower)

The importance of workshops, face to face meetings and site events

Interviewees highlighted both face-to-face meetings and site visits as important learning tools. Site visits enabling HEWAC members to ‘walk the ground’ were a popular suggestion by groups with previous planning experience. Although highly recommended in community development practice (often called a ‘transect walk’), it can often get overlooked in planning processes. As one stakeholder who sat on DRMAC reflects:

“One of the most beneficial things about DRMAC has been site visits, getting on the ground and talking to people. Every time we go down there we have a social function to get an idea of what is happening.” (Power Water representative)

“People that have been out there a long time, they have their own stories. When you begin a conversation you can find out what people know. People will talk about rivers and bores running dry, years of super floods and so on, they have a feeling for the level of variability of supply and they already recognise that there is a vulnerability to water.”(Local government representative)

WAC Membership – working to clear guidelines and accountability

Several stakeholders with long standing experience in DHAC stated that it would be important to keep the HEWAC group small, focused and working to clear guidelines and achievable targets. The use of a larger group, it was noted, that represented too many stakeholders would likely lead to frustration and participation fatigue.

Considering that HEWAC is tasked to provide advice and recommendations across four catchment areas, it will be important to engage people who are able put aside their aspirations for their local area and think strategically at a resource and policy level.

Keeping HEWAC focused by employing an independent chair with right of veto was considered to be ideal by stakeholders. The extent of the group’s operating arrangements, voting requirements and statutory authority however needed careful review. Power has been a key point of contention for the DHAC group recently who are now reviewing their terms of reference to demand greater accountability within the government. They relay frustration at the lack of feedback received from government explaining why it had or had not taken the advice advocated by DHAC:

“...[T]here doesn’t seem to be any requirement for the government to tell us if they don’t like our advice why. We have reached the point several times in the last couple of years of saying this is a waste of time...We just wanted a means by which we get heard and told when we are wrong, or when our advice is not accepted.” (DHAC representative)

When asked about the degree of statutory authority that should be attributed to the HEWAC, one interview participant used examples from interstate catchment planning to illustrate that it must be treated with caution:

“When you look at the history of NSW catchment management authorities...they had everyone around the table and gradually transferred more and more responsibility in legislation on to community groups and withdrew resources. It’s a fantastic way of saving money...you have to be careful; good institutional stuff can be a smoke screen for government withdrawal.”(CDU representative)

When reflecting on the DRMAC planning experience, one stakeholder commented on the importance of choosing the right representatives:

“People need to come with an open mind and be prepared to compromise ... inflexibility can threaten the rest of the group. During the DRMAC sessions one stakeholder walked out of the WAC because others were refused to compromise their viewpoint. This was despite that stakeholder making the most concessions.... Other problems emerged when stakeholders started meeting the Ministry externally and using lobbying experience to sway decisions outside of the group.”(NTCA representative)

In interviews, a number of stakeholders were apprehensive about using the existing DHAC framework to represent the broader interests within the TEWCD. This is clearly put by one stakeholder:

“I have a view that using DHAC is a mistake. One of the beauties of what’s happened in the Katherine region and in DRMAC and others is that there has been a good process to get people to represent in the various sectors. DHAC, if its bought in to the represent the Darwin regional area, will send the wrong message because it’s preconceived ... and because you’re using a pre-existing grouping. John Baileys gone, the Larrakia lady has gone, and one other has gone and it’s all tied up with gas plants and really emotive stuff...My advice would be to start from scratch.” (Litchfield Shire resident)

Another participant reflected on a stalled policy commitment made in 2005 that aimed to develop a ‘living rivers’ program for the protection of NT rivers. While a discussion paper was written for internal review, the language used within it was perceived to be too biased toward conservation values and not adequately representing the interest of other stakeholders. The result was a lack of support from these groups, losing continuity, momentum and indefinitely stalling the process.

Timing and the creation of a ‘safe space’ for dialogue

The timing of meetings is very important for some stakeholders who live long distances from urban centres or work long hours depending on season (for instance growers and pastoralists). These stakeholders may be absent for more meetings than other stakeholders and need additional time to give feedback as a group. Site visits, at appropriate times, may help build understanding and retain the feeling of ownership that these stakeholders might be missing.

“It has to be something that can be done in 2 or 3 hours and is not patronising. People are busy; they don’t like to go to an evening meeting too late.” (Cut Flower grower)

It is also important to create opportunities for dialogue and teamwork at the right time, when everyone feels comfortable to participate and there are no surprises or

hidden agendas. The attributes required for making a 'safe' and supportive environment to encourage productive dialogue and discussion can be discussed in a group, but might include adjectives like: fairness, impartial, equitable, innovative, trustworthy, listening, accessible and integrative.

'Safe' and productive spaces need to be lead by a good facilitator who is neutral, independent and capable of listening or motivating others. As commented by one participant:

"It's about the person who's doing the engagement and how they are perceived, whether they are trusted and you can have hard messages. Ian [Lancaster, NT Water Controller] has demonstrated you can give difficult messages to people...provided they trust you they are prepared to cop it."(Government representative)

Thinking strategically about new ways to manage resources

Many stakeholders were pleased with this project's research objectives and the chance to participate in new planning tools. Many relayed good learning outcomes from previous CSIRO workshops, such as the recent workshop involving an expert panel and stakeholders in Howard Springs. Other cited other examples such as the use of adaptive management and scenario planning:

"It has been rewarding to learn and use an 'adaptive management' approach (described as incremental development with checks/balances and review periods) to development and land use. It might be a good system for the greater Darwin Harbour area because there is a good understanding of indicators that can assess ecosystem health."(Government representative)

"We did a scenario planning exercise a couple of months ago and we got people from the community and government agencies and we did four scenarios for land use in the northern Territory out to 2050... the process was very empowering because it was very safe to have those conversations." (Government representative)

Planning for multiple catchments will be a key challenge for HEWAC, which must develop allocation plans for four catchments including the Darwin City area. According to a participant involved in DHAC research group, a big task will be to get people thinking holistically.

"The big issue [to workshop] is this whole of system approach. Thinking of the Darwin harbour as related to the Adelaide River etc is not 'out there'. How you workshop that in almost total absence of data will be a challenge but you can probably pull together a few people to think about the hydrodynamics, the land use plans or change plans for the Adelaide River, the Mary River, sea level effects. You can think through in principal what the issues are." (CDU representative)

Making policy decisions relevant to stakeholders

In order for communities to better engage with a WAC, it will be necessary to deliver messages that make actions or decisions relevant to people on an individual level. Many interview participants talked about the rural residents perceptions that the government intended to charge them for water if they allowed their bores to be metered.

“People have sunk all kinds of money into bores. When you suddenly say to people that there is a finite limit to this [water] and we need to manage it the message that people get is that they [the government] wants to regulate water from the bore they have already paid for. This brings out a conservative country attitude of ‘you’re not going to come near my bore’. You can change it by letting people vent their anger and keeping them engaged and explaining how aquifers work. There are a lot of informed people out there so the arguments have to be good. You need to provide info to the level of your audience. You can’t just assume people are ignorant. A lot understand the issues and it’s got to be clear so people without much understanding can understand the concept but you can take it to whatever degree is necessary to be able to debate and discuss the situation, even with entrenched interest. It’s a big ask.” (Litchfield Shire Resident)

Finding the right ‘balance’ between stakeholders that represents all interest groups

Maintaining a ‘balance’ between industry, indigenous and environmental values was viewed as important by a number of stakeholders. Stakeholders reflecting on the membership of the Darwin Harbour Advisory Committee saw the current lack of industry representation as detrimental to the group’s capacity to engage in robust and informed discussions. This led to a potential bias of group outputs and a perceived loss of public credibility:

“ [DHAC] is essentially a community group and we are reminded by our few industry people that it is essentially an environmental group. That’s probably true.” (DHAC representative)

This was reiterated by a government employee, when considering previous attempts to employ industry.

“The balance of [the]...WAC will be very important; you need to ensure that industry is well represented. To date, input from the Chamber of Commerce has been hard to secure.”(Government representative)

Summary of stakeholder recommendations for initiating HEWAC

The Table below summarises the insights from stakeholder interviews to form a series of recommendations that, if implemented, should assist NRETAS’ water planners in facilitating optimal stakeholder participation in HEWAC.

Table 6: Key recommendations for HEWAC derived from stakeholder interviews

Areas for support as identified by stakeholders	Recommendations from stakeholders
General support of HEWAC members	<ul style="list-style-type: none"> • Employing fulltime administrative and technical staff to support HEWAC members • Ensuring industry is well represented and the group has a balance between consumptive and non-consumptive values • Selecting an experienced and independent Chair • Increasing accountability of Ministers office to HEWAC members • Introducing clear guidelines and objectives for HEWAC group

	<ul style="list-style-type: none"> • Ensuring clear statutory authority and terms of operation • Optimal use of subcommittee structure • Streamlining decision making processes through use of effective tools
HEWAC community engagement	<ul style="list-style-type: none"> • Developing a comprehensive community engagement and communication strategy • Mail outs and email distribution list for meeting minutes • Appropriate times and methods for public submission by subcommittee groups and community • Utilisation of popular media programs, incl. talk back radio • Encouraging site visits and field days • Using language that facilitates community understanding
HEWAC knowledge & capacity building	<ul style="list-style-type: none"> • Identifying and assessing knowledge needs of broader group • Providing relevant information to keep group informed between meetings • Organising a Technical Advisory Group to provide independent expert advice • Providing appropriate training opportunities to interested group members (through collaborative tools, workshops, information sessions etc)

It should be noted that the project team has further identified barriers and enablers of water planning in two retrospective case studies of water planning process in Northern Australia - the Gulf of Carpentaria in Queensland (Mackenzie 2008), and the Ord River region in Western Australia (Ayre 2008).

Summary and conclusions for stakeholder analysis

The results represented in this study are intended to inform the discussion and community engagement strategy to support NRETAS in its future water allocation planning process in the Howard East Aquifer. Its main findings from stakeholder interviews indicate the three areas that need to be addressed in the forthcoming water planning process for the Howard East aquifer.

1. Capacity and knowledge. Improving the capacity of different stakeholders to understand the environmental requirements of local groundwater systems, as well as the needs of the community should lead to a greater willingness to engage in planning processes to discuss important issues and plan for long term sustainability of system.

2. Building trust. Assurances that Water Advisory Committees (WACs) will have a meaningful impact on government decision making processes will encourage participation from all stakeholders. WACs will need assurances that their conduct will be open, transparent and involve a comprehensive community engagement strategy that gives the public opportunities for input on contentious issues. If the public feels like its input is taken seriously, subsequent decision making is more likely to gain traction and acceptance

3. Examining tradeoffs in urban and rural water supply. Provided there is a shared understanding of the resource base and demands upon it, stakeholders should be better equipped to examine key issues and understand the values and perspectives of different stakeholders. This should prepare them to make informed decisions about environmental, economic and social trade offs involved in water allocation.

These findings will inform the selection of a 'fit-for-purpose' planning tool that has led to the development of a participatory groundwater modelling exercise currently underway in the Howard East. The model aims to build understanding and trust amongst the rural Darwin community in the science underpinning decision making and planning.

Results from this work (and other) case studies will be pooled, and lessons learned will inform a national toolkit detailing a number of methods, strategies and workshops that elicit community engagement and confidence in water allocation planning. Further development of these concepts will be available in the project's final report, due in October 2009.

References

- ABC Rural Country Hour (29/05/2007) (2007). Should Irrigators Pay for Water?
- ABC Rural Country Hour (30/05/2008) (2008). No Food Bowl in the Top End.
- Amateur Fishermen's Association of the Northern Territory (2008). Recreational Fishing Plan an election must.
- Connell Wagner Pty Ltd (2002). Darwin Harbour Strategy: Darwin Harbour Strategic Plan for Beneficial Uses.
- Cook, P., D. Hatton, et al. (1998). Hydrological investigation at Howard East, N. T.
- Department of Infrastructure, Planning and Environment (2003). Darwin Harbour Regional Plan of Management.
- Darwin Harbour Advisory Committee (2003), Darwin Harbour Regional Plan of Management. Department of Infrastructure, Planning and Environment, Darwin.
- Department of Lands, Planning and Environment (2002). Litchfield Planning Concepts and Land Use Objectives, Darwin.
- Department of Primary Industry, Farming and Mines (2008). DRPIFR Story: dedicated and geared for growth and demand, Darwin.
- Girraween Landcare Group Inc.(2007), Girraween Lagoon: Values, condition, threats and strategies for its sustainable use, Darwin
- Gray, B., (1998). Collaborating: Finding common ground for multi-party problems. Josey_bass, San Fransico
- Hamstead, M., C. Baldwin, et al. (2008). Water allocation planning in Australia - current practices and lessons learned.
- Jackson, D., 'Equitable access and water rights in the NT, an indigenous perspective'. Presented at the Charles Darwin University Water Sympsoium, May 2008.
- Jackson, S. and O'Leary, P (2006) Indigenous Interests in Tropical Rivers: Research & Management Issues. Report to Land & Water Australia, North Australian Indigenous Land & Sea Alliance, Darwin.
- Land and Water Australia, CSIRO, et al. (2006). An Assessment of Social and Economic Values of Australia's Tropical Rivers: A scoping report to Land and Water Australia's Tropical Rivers Program.
- Mackenzie, J., Collaborative Planning, Retrospective Case Study: Water Planning in the Gulf of Carpentaria, Tropical Rivers and Coastal Knowledge Publication 4.1, Griffith University, Brisbane.
- McMinns Lagoon Reserve Association (1999). McMinns Lagoon Wildlife Reserve.

NRETAS (2008): Sustainable development and management of water resources in Northern Australia: a model approach, NRETAS Bore Metering Update, November 2008, Draft.

NRETAS (2008), Groundwater in Darwin Rural Area: A PowerPoint presentation, Water Resources Branch, Land and Water Division, Palmerston

Northern Territory Government (2006). Palmerston District and Darwin Region Socio Economic Snapshot.

Parks and Wildlife Commission of the Northern Territory (1997). Holmes Jungle Nature Park Plan of Management.

Parks and Wildlife Commission of the Northern Territory (2000). Knuckey Lagoons Conservation Reserve Management Plan.

Power and Water (2008). The Darwin Water Story.

Australian Bureau of Statistics (2001). "Population Projections, Northern Territory, 1999 to 2021 ".

Williams, L. (2006), A Larrakia perspective of Larrakia archaeological sites and levels of significance, Prepared for the Darwin Harbour Advisory Committee, 2006.

Wild River Su (1998), Striving for balanced environmental planning in Litchfield Shire, Australian National University

Woodward, E. and Jackson, S. (2008). Howard River Workshop - Charles Darwin University, May 15th 2008.

Woodward, E., Jackson, S. and Straton A., (2008), Howard River environmental flows and social values: A project to support water planning in the Howard River Catchment, 2008.

World Wildlife Fund and The Environment Centre NT (2006). A Way Forward for Developing a Living Rivers Program for the Northern Territory

Annex A: Questionnaires, Information pack and Consent forms

Basic Stakeholder Analysis Questions

NB: Sub-questions are to be used as prompts where necessary.

- 1. What do you think are the main issues for water allocation and management in this area?**
 - a. At a local level? At a regional levels?
- 2. How are you affected by these issues? How concerned are you about these issues?**
 - a. In what ways is water important to your organisation?
 - b. How important is water to your livelihood/business? Recreation? Culture?
 - c. How is it likely to affect you in the future? The future of the region?
- 3. Who else in your local area or in the region is involved in decisions about water allocation and management? Do you think they share the same concerns as you? What other concerns do they have?**
 - a. Are they concerned about how much water they use, either not being able to access enough or others using too much?
 - b. Water quality and the environment?
 - c. Costs and pricing?
 - d. Anything else?
- 4. Aside from business and recreation, what activities do you currently take part in with regards to water?**
 - a. For instance, are you involved in community waterway monitoring or re-vegetation? Are you a member of a Landcare group, volunteer group or industry body?
- 5. How do you get information about water issues or policy/planning?**
 - a. What access to information do you have? Is it sufficient?
 - b. Could it be improved?
- 6. Have you ever been consulted or taken part in a government resource or environment planning process?**
 - a. If yes, based on your experience, what were the best and worst parts of this experience?
 - b. Can you think of ways to improve this process?
- 7. How much do you know water planning? (Use Handout)**
 - a. Are there areas of water management that you would like to know more about?
- 8. In addition to more information, what else would assist you to participate in the water planning process?**
- 9. Are there other groups or people who in your community that you think I should speak to?**

Please indicate which of the following areas you know about, and which you would like more information on:

		I have sufficient knowledge about...	I would like more information about...
Institutional arrangements for water	State water laws and regulations	<input type="checkbox"/>	<input type="checkbox"/>
	The water allocation planning process	<input type="checkbox"/>	<input type="checkbox"/>
	National priorities for water security and allocation	<input type="checkbox"/>	<input type="checkbox"/>
	Existing licensing arrangements	<input type="checkbox"/>	<input type="checkbox"/>
	Water trading	<input type="checkbox"/>	<input type="checkbox"/>
	Water pricing	<input type="checkbox"/>	<input type="checkbox"/>
	Regional natural resource planning and management	<input type="checkbox"/>	<input type="checkbox"/>
Technical information	The science of hydrology including surface and groundwater flows	<input type="checkbox"/>	<input type="checkbox"/>
	River ecology and biology	<input type="checkbox"/>	<input type="checkbox"/>
	Surface/groundwater interactions	<input type="checkbox"/>	<input type="checkbox"/>
	Environmental flow requirements	<input type="checkbox"/>	<input type="checkbox"/>
	Hydrological modelling	<input type="checkbox"/>	<input type="checkbox"/>
	Water use efficiencies	<input type="checkbox"/>	<input type="checkbox"/>
	The impact of climate change on water availability	<input type="checkbox"/>	<input type="checkbox"/>
	Monitoring water quality	<input type="checkbox"/>	<input type="checkbox"/>
Regional information	Historical water use in the region	<input type="checkbox"/>	<input type="checkbox"/>
	Current water use in the region	<input type="checkbox"/>	<input type="checkbox"/>
	Requirements of existing water users	<input type="checkbox"/>	<input type="checkbox"/>
	Population and economic trends in the region	<input type="checkbox"/>	<input type="checkbox"/>
	Future water demands of the region	<input type="checkbox"/>	<input type="checkbox"/>
	Water use and future requirements of Indigenous communities	<input type="checkbox"/>	<input type="checkbox"/>

Collaborative Water Planning

Consent Form

Research Team

Names: Assoc. Prof. Poh-Ling Tan, Dr Sue Jackson, Dr Peter Oliver, Dr Wendy Proctor, Dr John Mackenzie, Sharna Nolan

School(s) / Centre(s): Socio-legal Research Centre (Griffith University); CSIRO Sustainable Ecosystems

Contact Phone: (07) 5552 8177 (Griffith University), (08) 8944 8412 (CSIRO)

Contact Email: P.tan@griffith.edu, Sue.jackson@csiro.au

By signing below, I confirm that I have read and understood the information package and in particular have noted that:

- I understand that my involvement in this research will include a semi-structured interview on water resource planning;
- I have had any questions answered to my satisfaction;
- I understand the risks involved;
- I understand that there will be no direct benefit to me from my participation in this research;
- I understand that my participation in this research is voluntary;
- I understand that if I have any additional questions I can contact the research team;
- I understand that I am free to withdraw at any time, without comment or penalty;
- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on (07) 3875 5585 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and
- I agree to participate in the project.
- I agree/disagree to have the interview recorded.
- If the interview is recorded, then the contents will be transcribed and the audio tape destroyed. My personal details will not be recorded in the transcript. If I disagree to be recorded, then notes will be taken of the interview, and these will be made available to me at my request.

Name
Signature

Date



Information package

Collaborative water planning project

Reason for the research

All around Australia governments are working with communities, industry and the public to try to plan the best way to manage water. In this research project we are looking at ways to:

- improve these collaborative approaches to water planning
- improve ways to involve communities, industry and the public
- include social, cultural and economic values in water planning, especially those held by Indigenous people.



Who is conducting the research?

This research is being done by Griffith University, Brisbane, and CSIRO. These organisations have also asked one other expert to be involved. The research team is made up of:

Dr Poh-Ling Tan *Project Leader*,
Associate Professor, Griffith University, Brisbane
Phone: 07 3735 4182, Email: p.tan@griffith.edu.au

Dr Sue Jackson *Senior Researcher*,
CSIRO Sustainable Ecosystems, Darwin
Phone: 08 8944 8400,
Email: sue.jackson@csiro.au

Dr Peter Oliver *Principal Natural Resource Officer*
Social Scientist with Qld. Dept. Natural Resources
and Water, Nambour. Phone: 07 5451 2261
Email: peter.oliver@nrw.qld.gov.au

Dr Wendy Proctor *Stream Leader - Water Sharing*,
CSIRO Water for a Healthy Country Flagship, Canberra
Phone: 02 8246 5955
Email: wendy.proctor@csiro.au

Dr Margaret Ayre *Research Fellow*,
CSIRO Sustainable Ecosystems, Darwin
Phone: 08 8944 8412, Mobile: 0400 537 280
Email: margaret.ayre@csiro.au

Dr John Mackenzie *Research Fellow*,
Griffith University, Brisbane,
Phone: 07 3735 5408, Mobile: 0405 433 550
Email: john.mackenzie@griffith.edu.au

What you would be asked to do

We would like to have a talk with you about your experience of water planning. We will ask about how you have been involved and what happened as a result. We will also ask you whether you think what happened was good, or how it may be improved.

We would like to make a voice recording of our talk with you and also make some notes on what you say. We may decide to get only some interviews typed up, and in other cases only make rough notes of the interviews. Your personal details are not recorded in the typed notes.

Why you have been asked to be involved

We have selected a range of river systems throughout Australia and are studying the way water planning has taken place in these areas. By reading the water plans and reports that have come from these areas and talking to others who have also been involved, we have become aware of your involvement in water planning.





Expected benefits of the research

By talking to you we will learn about different ways that water planning may be made better. We will use what we learn to develop and try out improved tools for collaborative water planning, in two river systems in northern Australia, working alongside government agencies that do water planning. We will also develop guidelines for collaborative water planning as a result of this project.

The potential risks relating to your involvement

Risks to you from your involvement in this project are very small. There may be some people who will not like what you tell us about water planning. We will carefully record and try to understand exactly what you tell us. We will not identify you to anyone else as the person who has said these things.

Confidentiality of records and reporting of results

We will store the records of what you tell us locked in a safe place. We will use codes to identify these records. We will keep the list of names of people and their codes locked in another safe place. If the interview is transcribed (typed up) the audio recording will be destroyed.

When we report what you have told us to others, we will either not do so in a way that will allow them to identify you or, if your comments are directly quoted in our report, you will decide whether you would like to have the comment attributed to you.

Voluntary participation

Your involvement in this research is totally voluntary. You do not have to talk with us. You can stop being involved at any time without anything bad happening to you.

Further questions

If you have any questions, please do not hesitate to contact any member of our research team. We are only too willing to talk with you and listen to any concerns you may have.

Concerns about ethical conduct

You may have concerns about the ethical conduct of this research. If so, please contact the Manager, Research Ethics, Office for Research, Bray Centre, Nathan Campus, Griffith University, phone 07 3735 5585 or email: research-ethics@griffith.edu.au

Feedback

We will send you a letter to let you and other people know what we have learnt about better ways government agencies can involve community, industry and the public in water planning. We also have a website where you can find out results of the research. We would welcome you contacting us if you wish to discuss this research project or your involvement:

www.griffith.edu.au/centre/slr/water

Privacy Statement

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements. A de-identified copy of this data may be used for other research purposes.

However, your anonymity will at all times be safeguarded. For further information consult the University's Privacy Plan on: 07 3875 5585 or by visiting: www.griffith.edu.au/ua/aa/vc/pp



*This project aims to develop a new approach to water planning in Australia's tropical north. It is a part of TRaCK – the Tropical Rivers and Coastal Knowledge research hub. TRaCK brings together leading tropical river researchers and managers from across Australia to focus on the sustainability of rivers and catchments from Cape York to Broome. Visit: www.griffith.edu.au/centre/slr/water or www.track.gov.au
Funded by the Australian Government's Raising National Water Standards Programme*