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# WIDCORP Knowledge Base

Background Paper

June 2006

Report no. 1/06

**Prepared by:**

WIDCORP

Version 1

Published by: Water in Drylands Collaborative Research Program  
(WIDCORP)

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Publication data: WIDCORP Knowledge Base – Background report and Proposed project plan June 2006

Author: Dr Imogen Schwarz

Report no: 1/06

Version: 1

Design: WIDCORP

Printed by: WIDCORP

# Foreword

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Water is a scarce resource. Less than one percent of the world's water is usable fresh water. The value of water is becoming increasingly important, especially in the Wimmera Mallee where continued drought years and climate change have placed great pressure on the availability of water for its various uses. In this region, substantial change is underway to the current stock and domestic channel system, with construction of the Wimmera Mallee pipeline which will replace 16,000 km of highly inefficient earthen channels responsible for the loss of up to 85% of water through seepage and evaporation. Although the pipeline will provide a reliable, quality water supply and save up to 103 000ML of water per year, the actual amount of water available will depend on climate.

The Water in Drylands Collaborative Research Program (WIDCORP) is a group of peak organisations from the Wimmera Mallee and University of Ballarat working collaboratively to study the social, economic and environmental impact of this additional water on the community. Using the Wimmera Mallee Pipeline as a case study, this research focuses on identifying water uses and water values in a dryland region; how communities balance the competing demands for water and; how communities can best maximise opportunities made available as a result of the pipeline. Research is undertaken concurrently with the construction of the pipeline and forms the basis for an on-going research program at the Horsham Campus of the University of Ballarat. The research frameworks and outcomes are expected to provide useful base models which can be modified for dryland communities elsewhere in Australia and globally.

This report provides an overview of relevant background information for building knowledge-base which will capture the knowledge-needs of the various audiences of WIDCORP to improve and maximise information flows and linkages across this community. This information will form the basis for discussion of the proposed knowledge base. In particular, this document reports the findings of stage one of this project – a focused 'trial' to identify the knowledge needs of one of three main WIDCORP audiences, *the WIDCORP members*. This includes results from a website audit and from consultation with representatives of this audience to share their ideas on the development of this knowledge base. Options and recommendations for building this knowledge base trial project are detailed at the end of the report. The attached document titled 'proposed project plan' outlines the project brief for the establishment of the knowledge base trial project.



Dr Pam McRae-Williams  
Research Director

# Acknowledgements

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Thanks to the people who were involved in the consultation process to identify the knowledge-needs of the *WIDCORP members*. Your input was greatly appreciated and an invaluable part of planning the initial stages of the knowledge base trial project.

Thanks go to Helen Thompson (CECC), Patrice Braun (CRIC), Megan Deutscher (WIDCORP), Pam McRae-Williams (WIDCORP), Joel Epstein (IRRRI), Paul O'Connor, staff at University of Ballarat and WIDCORP, for their scholarly advice and support over the development of this trial project.

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# Executive Summary

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WIDCORP aims to build a structured knowledge base, as highlighted by the WIDCORP Research Plan. The document provides an overview of relevant background information to build a knowledge-base to capture the knowledge-needs of the various audiences of WIDCORP to improve and maximise information flows and linkages across this community of practice.

In summary, the aim of WIDCORP's knowledge base is to provide an efficient and effective system for acquiring, storing and sharing knowledge. Knowledge includes information resources from 'out there', as well as knowledge people gain from experience. Building a community of practice around our knowledge topic will enhance the interactions among our audiences and provide a platform for more creative and extensive collaborations. The design of the knowledge base needs to reflect our audiences' needs, and knowledge that is important to WIDCORP's core business activities.

This document reports on the findings of stage one of this project – a focused 'trial' to identify the knowledge needs of one of WIDCORP's three main audiences, *the WIDCORP members*. This includes results from a website audit and from consultation with representatives of this audience.

Findings from a website audit identified gaps in the stakeholder's current websites information of which WIDCORP's knowledge base could possibly improve by integration of existing information, and providing new information. Suggestions for improvement of features to extend and increase value of existing knowledge found on current websites include:

- Provision of a centralised repository of locally relevant background information on the WM pipeline and current research projects in the Wimmera-Mallee region.
- Provision of more interactive opportunities for online discussion forums to enable community opportunities to provide feedback, opinions and to share local know-how between community groups.
- Provision of national and international links to 'water-in-drylands' related projects, authorities, institutes and publications, where possible.
- Provision of links to more academic literature worldwide covering the social, environmental/ecological, and economic topics related to rural (dryland) communities and water management, water in drylands, and the value of water, its usage, and its competing demands.

Consultations with WIDCORP members asked participants to convey their ideas on information which was of value to them from WIDCORP, from locally relevant sources and from the affiliated water industry and other key sources. In summary it was found that WIDCORP members want information most relevant to their scope of professional practice.

- Researchers within WIDCORP require information across social, economic and environmental topics about water-in-drylands research relating to local, national and international resources.
- Water authorities and other R&D institutes (ie. DPI, BCG) are interested in understanding WIDCORP research programs and outcomes, and seek knowledge on lessons-learned from parallel communities facing similar

changes. Some water authorities identified the need to engage with regional development and build knowledge in this area.

- Health services require social demographics, and are less interested in water-related information.

These findings from WIDCORP members' website audit and consultations will inform the design phase of the pilot project for developing the knowledge base. The document outlines ways in which WIDCORP can assess the knowledge needs of our other two main audiences – 1) *the community and stakeholder audience* and 2) *academic audience*.

Three design options for the 'trial project' phase were developed outlining the form and function for each option, which vary in complexity. Below is a brief summary of these options.

Option 1: WIDCORP specific: The objective of option 1 is to provide WIDCORP members with general information on WIDCORP's activities, facilitate collaboration among WIDCORP members, and awareness of the broader context of the water-affiliated industry, policy and practice. Whilst starting points are provided to external resources, users will be required to 'weed' through information to find what is useful to their needs.

Option 2: Regionally specific: Option 2 would have all features of the basic model in addition to those listed below. The objective of this option is to provide more locally-relevant current and historic information related to the triple-bottom line and to situate the local context within a national and global scale. The Corangamite CMA Knowledge Base (<http://www.ccma.vic.gov.au/>) provides a good example of the design features in this level.

Option 3: Advanced interactivity: The advanced option includes the two options above. This option also has greater interactive functions, more databases and increased search capabilities.

## **Recommendations**

In order to guide the development of the knowledge base recommendations are:

- 1 Agree upon a set name for the knowledge base to reflect the knowledge topic and WIDCORP core business.
- 2 Establish a knowledge base policy to set boundaries around our core organisational activities and knowledge topic. This policy will ensure knowledge users and distributors have clear, accessible guidelines as to how knowledge is shared, synthesised and managed through the knowledge base.
- 3 Create a knowledge map to visually categorise and classify knowledge valued by WIDCORP and its audiences, to provide a structural framework on which the knowledge base may operate.
- 4 To conduct a 'trial project' of knowledge base, focusing on the knowledge-needs of the WIDCORP members
- 5 Identify (a construction and ongoing maintenance) budget for each of the knowledge base options to determine which one is viable.
- 6 Select one of the three options (or an amended/alternative version) to develop a knowledge base based on this trial project and linked to our website.
- 7 Write a project plan for trial project of knowledge base including processes involved for implementation (see 'proposed project plan' attached).
- 8 Seek expert advice on development and implementation of knowledge base from CECC and arrange for select tender to set-up knowledge base.
- 9 Elect and arrange training for 'knowledge support officer' to maintain and manage knowledge base.

# Background Paper

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## 1 Introduction

### 1.1 Water in Drylands Collaborative Research Program (WIDCORP)

The initial phase in developing a knowledge base is to identify our core organisational activities and goals in order to define our knowledge requirements [1]. WIDCORP is a group of peak organisations in the Wimmera Mallee working in collaboration to undertake national and international research to support opportunities for the region, arising from the supply of reliable quality water through the Wimmera Mallee pipeline project. WIDCORP's core business goal is to research the social, environmental and economic sustainability of (Wimmera-Mallee) rural communities and ecosystems in dryland regions undergoing major water reform.

In line with the projected outcomes of the Wimmera-Mallee Pipeline project, the research program encompasses three main objectives:

- To undertake collaborative research that will assist the Wimmera-Mallee regional stakeholders to identify and maximise opportunities created as the Pipeline Project progresses.
- To develop a research program that contributes to community capacity building in a rural region.
- To undertake research which will inform state, national and international organisations of investment in major infrastructure in rural regions as it relates to regional sustainability.

The significance of this research program is highlighted by the following priorities. Firstly, the Wimmera Mallee pipeline project provides a unique opportunity to investigate water use and water values of a dryland region, in this case, the Wimmera Mallee region. This research is considered the first in this area and therefore the research outcomes are expected to provide useful base models to assist other dryland communities in Australia and globally, identify local frameworks for sustainability. Secondly, the research will contribute to water reform in Australia by developing a comprehensive picture of water valuation components in a dryland region. The research is also of national benefit as it will address a number of key National Priority Goals including "Water – a critical resource"; "Sustainable use of Australia's biodiversity"; "Responding to climate change and variability: and Strengthening Australia's social and economic fabric".

These above features of the research program identify the need for development of a knowledge base which considers both the interplay of knowledge from community, stakeholders and further a field, as well as the unique overlap of knowledge topics. Furthermore, it is important to understand what knowledge would be valued by the various audiences defined later in this paper – to identify and enable access to, existing knowledge, and to enable access to new knowledge.

### 1.2 Rationale

The "Draft WIDCORP research plan" highlights that one of this year's main research goals is to build a structured knowledge base. It has been made evident by the various views expressed amongst the *WIDCORP members* and *UB academic audience* that there are a number of issues to consider when building this knowledge base (see Appendix A for WIDCORP audience definitions). These include questions like: what constitutes knowledge; how do we conceptualise a "knowledge base"; what

is the knowledge topic; who will have access to and want to use the knowledge base, and who will it be useful for – i.e. will it involve community members and not just stakeholders. The purpose of this document is to provide an overview of relevant background information including an audit of the knowledge-needs of *WIDCORP members*, and recommendations, which will form the basis for discussion of the proposed knowledge base.

### 1.3 Defining a knowledge base

Defining a “knowledge base” is complex and multi-faceted. Conceptualisation of a “knowledge base” involves consideration about what knowledge is, how it can be sourced and how we can store and share knowledge.

*Knowledge*, for the purpose of this exercise, is considered information which is generated and preserved through our experiences, perception, learning and reasoning. Knowledge allows for informed approaches to decision-making and generation of activities [2]. Lack of information, poor communication and inadequate processing of existing information create gaps in our knowledge and are major barriers to effective research and practice.

Knowledge can be obtained from a number of different *knowledge sources*. Knowledge sources are found in two main forms: explicit or tacit. Explicit knowledge sources are easier to share as they are tangible (ie. documents, artefacts, websites etc.), whereas tacit (or intuitive) knowledge sources are more elusive. The exchange of intuitive knowledge involves acquiring know-how and expertise to successfully conduct an activity (ie. identify best-practice), however as tacit knowledge often resides in the minds of individuals, (or for example the “minds” of other organisations) it is more difficult to grasp. This will be one of the challenges for WIDCORP, for example, in capturing local community knowledge and know-how. Knowledge may be further categorised according to its source type in terms of its relative rating of ‘value’. For example some knowledge is *robust* and based on well-established research methodologies, or a validated measure which has been tested over time and found to be true. Other knowledge may be *dynamic*, constantly shaped by new experiences and insights [1].

A *knowledge topic* defines a particular area of knowledge useful for a person or a particular *community of practice* [3]. Within this community, (which is defined by its context around a particular knowledge topic), knowledge is imparted and skills practiced through interaction, learning, network development and through the use of tools, frameworks, idea sharing, artefacts, or documents. Through developing a knowledge base, WIDCORP is creating its own community of practice centred on a particular knowledge topic. Etienne Wenger, one of the foremost experts in this field highlights the value of establishing a community of practice:

*Communities of practice are a specific kind of community. They are focused domain of knowledge and over time accumulate expertise in this domain. They develop their shared practice by interacting around problems, solutions, and insights, and building a common store of knowledge [4].*

A *knowledge management system* is an “information and communication technology platform combining and integrating functions for handling knowledge” [2]. Our WIDCORP knowledge base is defined in this way and would operate on a web-based platform. Web-based or networked information technology is one of the most common mechanisms to provide this opportunity for sharing knowledge in a way which is cheap, cost-effective and accessible to a widespread audience [5].

In summary, development of the knowledge base requires consideration of how to capture, synthesise, transfer and share knowledge [2]. Today, knowledge management is a key endeavour of modern-day corporations [3] as its main activities are to solve how to *acquire*, *store*, and *share* information [6]. In effect, knowledge management will be a fundamental principle in establishing and maintaining this knowledge base.

### **Box 1: Major Overview - Plan of Activities in Creating a Knowledge Base**

#### Phase 1: Research & Design

a. Define user needs & content requirements of WIDCORP main audiences. Choose one user group as trial project to inform initial site development.

b. Analysis/report of findings from user consultations.

c. Design interface (website) for knowledge base:

Establish technical framework, consider (i) technical design to match user limitations ie. low speed modems, minimal computing capacity and user skills; (ii) authentication of content ie. open-up content for comment and review to register local viewpoints; Search words/taxonomy for the knowledge base.

Define controlled access for KB and search options – dependent on status as student, stakeholder or external user.

d. Research, consultation and policy decisions on procedures for contractual, copyright and financial arrangements for deposits into the knowledge base

#### Phase 2: Collect & Collate

a. Collect and prepare information to be entered into the knowledge base (according to user group needs). This includes research and consultation on intermediate storage decisions.

b. Conduct an initial trawl to collect information from local, state, national and international sources, as applicable, to be entered into the knowledge base.

#### Phase 3: Disseminate & Evaluate

a. Trial run of knowledge base to evaluate its effectiveness to (selected) user group(s) in terms of content applicability, user-friendly design (technological compatibility to user group), participatory capabilities of knowledge base (ie. user able to offer review, participate in online discussions, disseminate their local know-how) and to define areas of improvement.

b. Report on evaluation and recommendations for improvement. Redesign and re-evaluate knowledge base where applicable.

#### Phase 4: Ongoing Management & Development

a. Exploration and negotiation of suitable long-term website host(s) and 'knowledge support officers' for the knowledge base. This may include maintenance and management of knowledge base by WIDCORP, stakeholders, and community members.

b. Consider applications for funding to sustain the ongoing management and development of the knowledge base.

c. Conduct development of other areas of knowledge base according to selection of another user group. Repeat phases 1-3.

## 2 Steps in conceptualisation of the structured knowledge base

The review of literature in relation to developing this knowledge base reveals a number of key questions which must be addressed to conceptualise its structure:

- What is our knowledge topic?
- Who are the members of our community of practice and what are their knowledge-needs?
- What is the function and form of our knowledge base?

These questions form the framework steps for delivering a project brief of how to conceptualise the knowledge base. Each question will be addressed in turn.

Furthermore investigation of other repositories highlights the developmental steps of building this kind of web-based infrastructure. Box 1 overviews the major phases of development in relation to establishment of our knowledge base.

## 3 WIDCORP's knowledge topic

Defining our knowledge topic(s) is important to establish our 'identity' as a community of practice in a particular domain. At this stage, our knowledge topic encompasses multiple arenas under a 'water indrylands' theme: the areas of *social, economic and environmental/ecological sustainability* in (rural) dryland communities undergoing major water reform from open earthen channel systems to piped water. The value of water, its usages and its competing demands are integral to this topic.

## 4 WIDCORP's community of practice and their knowledge needs

In the 'WIDCORP Communication Strategy' (Draft, May 2006) document, we identified three main groups of people and organisations that form our communication audiences. These are the *WIDCORP members, the community and stakeholders*, and the *academic audience*. Descriptions of each audience are provided in Appendix A. As it is important to transfer and share knowledge amongst these people and organisations, they also then define our community of practice. It is envisaged that the knowledge base will improve the information flows and linkages in and between WIDCORPs community of practice.

In order to determine what information and resources will be valued by the community of practice, an audit of the knowledge-needs of each of these groups will be conducted. The usefulness of this exercise is expressed in principles for data management [7] including the need to 'present a sound business case' to support any data collection activity; to 'reduce duplication'; and to 'look before you collect' information to identify what already exists.

In the first instance, the aim is to conduct a focused 'trial project' to improve and maximise information flows and linkages in and between the *WIDCORP Members*. This forms part of a broader, comprehensive knowledge management strategy across our community of practice. The second and third (final) phases of building this knowledge base will include identifying the knowledge-needs and improving information flows and linkages in and between the other WIDCORP audiences – a) *community and stakeholders*, and b) *academic audience*.

## 4.1 Identifying the knowledge needs of WIDCORP Members

The first phase of the trial project required us to define the content requirements and knowledge-needs of our WIDCORP members. Findings from a website audit and consultations with representatives from the WIDCORP member organisations are reported below.

### 4.1.1 *Website Audit*

#### Method

An audit of the websites of the WIDCORP program partners was conducted to assess their existing resources and capabilities. The websites audited include those of the Department of Primary Industries (Horsham), Glenelg Hopkins Catchment Management Authority (CMA), Mallee CMA, Northern Central CMA, Wimmera CMA, Department of Sustainability and Environment (Victoria), Wimmera Uniting Care, GWM Water and its affiliated 'Piping It' website, specific to the Wimmera Mallee Pipeline Project. This information informs WIDCORP of the ways in which our knowledge base can provide complementary and supplementary information to what is included on our partners' websites to reduce duplication and inefficiency, and increase relevance for these users. This information informs the initial design features and contents of the knowledge base. It is suggested that our knowledge base aggregate the salient features of each of these websites through web linkages.

#### Findings

The main findings of the website audit are summarised below:

- Extensive local area information on Wimmera and Mallee natural resources (eg. land, water, ecology) and people (from ABS data) is provided by Departmental websites (DSE & DPI) however users are required to navigate their way through the generic web-pages to obtain this specific information.
- Local water authority websites have limited information to their organisation's operational boundaries (ie. strategic direction, staff profiles, projects), and regional (land and water) profiling, as well as resources on their current and proposed projects. Mallee CMA and Glenelg Hopkins CMA aim, through their individual databases, to collate abstracts of (research) projects conducted of their local, and adjoining regions; however there is no database that captures (research) projects across all of Western Victoria or indeed our Wimmera-Mallee region.
- Information on Wimmera-Mallee Pipeline, of which the majority is located on 'Piping It' website, is very limited. This website provides only snippets of information of the various components of this project in the form of fact sheets, newsletters and a 'milestones' timeline. Reports and background documents are not available. The website is geared towards the general community, and potential tender organisations that require a snapshot of the pipeline project.
- Most stakeholders' websites include related links to local, state and national government and non-government organisations, initiatives in the areas of land and water management, sustainability, environment, primary industries, local councils and research. However no website featured links that included a list of all of these areas, nor international links, or links to all the Australian water research institutes and water industry organisations.
- Information generated from these organisations is not contextualised within the broader international 'drylands' literature, nor is it academic.

There are a number of advantages that WIDCORP knowledge base could provide to its stakeholders by addressing gaps in their current websites information and by integration of this information:

- Provide a centralised repository of locally relevant background information on the WM pipeline and current research projects in the Wimmera-Mallee region.
- Provide more interactive opportunities for online discussion forums to enable community opportunities to provide feedback, opinions and to share local know-how between community groups.
- Provide national and international links to 'water-in-drylands' related projects, authorities, institutes and publications, where possible.
- Provide links to more academic literature worldwide covering the social, environmental/ecological, and economic topics related to rural (dryland) communities and water management, water in drylands, and the value of water, its usage, and its competing demands.

These findings from the audit of the WIDCORP members' websites will inform the design phase of the pilot project for developing the knowledge base.

#### **4.1.2 WIDCORP members audit**

##### Method

Targeted WIDCORP members from program partner organisations and the WIDCORP research team were invited to share their ideas on the development of WIDCORP's knowledge base. Through initial email correspondence, a fifteen minute telephone meeting was arranged to discuss questions detailed in Appendix C. Alternatively, respondents could fill-out their answers on the question schedule attached to each email. Not only did this give participants the opportunity to respond in their own time, but also the opportunity to digest the questions, and consider their ideas before the meeting. Follow-up with non-respondents was carried out one week later via email then telephone. Of the fourteen invitations, there were eleven responses. Ten participated in telephone meetings, and one via paper-format.

Participants represented the following organisations:

- Birchip Cropping Group – 1 participant
- Department of Primary Industries (Horsham) – 1 participant
- Glenelg Hopkins CMA – 1 participant
- Northern Central CMA – 1 participant
- GWM Water – 2 participants
- Wimmera Catchment Management Authority – 3 participants
- Wimmera Uniting Care – 1 participant
- WIDCORP Research Team – 2 participants (Research fellow and off-campus Ph student)

Invitations were also sent to the Department of Sustainability, the Mallee CMA and another GWM Water representative. At this stage replies (three, in total) have not been received from these members.

##### Findings

Findings from this audit are detailed in summary below, using the questions (see appendix C) as a guide to present results.

In general, there was some difficulty in communicating what a knowledge base is and therefore participants' views varying because of conceptual differences. For example, thinking about it as a website, or database rather than a knowledge base. This was a limitation to the audit.

The audit asked participants to present their ideas on the information which was of value to them from WIDCORP, from locally relevant sources, from the affiliated water industry and any other key sources. Participants were asked to identify key themes

and identify types of resources they could include from their organisation, as well as their willingness to host a link to the knowledge base on their organisation's website.

**Information from WIDCORP** of value to program partners was similar across the board. Program partner's main concern was to gain an understanding of WIDCORP's research projects through project summaries (11/11), research publications (11/11) profiles of researchers (11/11) and proposed or evolving research projects. Working papers were less valued and less understood – some raised issues around confidentiality of this type of information, as well as its misuse in taking pre-published information as final results. Most participants (9) were interested in accessing media releases; however some questioned the truth/reliability of this information – is it knowledge?

Suggestions of 'other' WIDCORP information useful for program partners included: having (restricted) access to links to WIDCORP member representatives which includes their contact details; including background references from WIDCORP research projects; and incorporating a suggestion box for feedback on the technical aspects of the knowledge base, its resources and opportunities for general comments or queries.

**Locally relevant information** included participant comments on information about Wimmera Mallee Pipeline Project, and 'other' information. Knowledge needs varied among the differing program partners. Wimmera Uniting Care viewed this information as 'not relevant' to their organisation, due to their health/welfare focus. There was general consensus amongst the WIDCORP research team respondents that all content on this project and about the region would be valued.

There were diverse opinions as to what information is necessary to include on the *Wimmera Mallee Pipeline Project*. The main issues were:

- Questioning the relevance of this information for the knowledge base (1 comment) and relevance for specific organisations (1 comment). This information is available on 'Pipe-It' website, so concerns about duplication.
- Keeping up-to-date on the current progress of the stages of the pipeline project and information about people involved – searchable by organisation or by topic. To include more general information, for example, on costs, timelines, water-levels, water saved, and details of piped system in Northern Mallee and Wimmera Mallee. For example, the knowledge base could serve like a press site where people can access relevant updates, which may enhance its useability, visibility and possibly long term viability once the KB becomes a well-known site to find this useful information.
- Focusing on the social/economic rather than technical information including capturing community opinions at the grass-roots level. For example providing openness and transparency in sharing knowledge and therefore giving opportunity for community groups (eg. Pipe Right Group; Landcare; other regional development groups) to provide feedback. An extension of this was about community engagement: How can knowledge be shared and exchanged in an effective way? Why do people respond in particular ways to knowledge sharing which leads to divisions?
- Lessons learned from the WM pipeline (include NMPP and WMPP reports) and parallel research of best practice models in other national or international regions facing similar issues (pipeline systems + in drylands).

The main resources mentioned by participants under 'other' locally relevant information can be divided into three main areas encompassing the 'triple-bottom line', and includes historic, current and projected information. (Design of KB should include a field to differentiate between what is relevant and what is historic information). Documents, information, reports relating to ecosystems/environment, economic and regional development, and social aspects of the community were of importance. Some keywords were mentioned around these three areas. Suggestions of the types of resources needed and whether available from participant's organisations are detailed in the table 1 below.

**Table 1: 'Other' locally relevant knowledge identified by WIDCORP members**

<b>Main theme</b>	<b>Key Themes</b>	<b>Resources</b>	<b>Possible Sources</b>
<i>Ecosystems</i>	<ul style="list-style-type: none"> <li>- Diversity in a piped system</li> <li>- Water-use efficiency/availability</li> <li>- Riparian, aquatic, vegetation, invertebrates, flora, faun, birds in dryland agriculture</li> <li>- Drylands</li> <li>- Climate change</li> <li>- Bioregional communities</li> <li>- Energy</li> </ul>	<ul style="list-style-type: none"> <li>-Regional profiles</li> <li>-Strategic plans from water authorities</li> <li>-Global map of dryland regions &amp; key experts in area of water in drylands</li> <li>-List of local flora &amp; fauna species</li> <li>- Environmental reports – GIS soils/landscape data, topographical maps, Murray-Darling basin, 'National action plan' –geophysical study to test salinity in groundwater</li> <li>- CMA reports such as project summaries, newsletters, regional catchment strategies (eg. river health strategy), annual investment programs, catchment condition reporting, environmental flow studies, EVC's, future landuse projects (pilot in Swanhill), CMA benchmarks around lessons learned, and link to publications webpages</li> <li>-Policy documents on environmental acts and history of water authorities</li> <li>-Historical land use patterns</li> <li>-“The archives” of 1<sup>st</sup> settlement</li> <li>-Historic town &amp; parish maps</li> <li>-List of water &amp; land acts governing the Wimmera-Mallee</li> </ul>	<p>CMA's, BCG, DSE, SNM, Environment Australia, CSIRO, GWMwater, D. McBride, The Rural Institute, UNE.</p> <p>D. McBride, Victorian Public Records Office</p>
<i>Social</i>	<ul style="list-style-type: none"> <li>- Social value of water</li> <li>- Social capital/well-being</li> </ul>	<ul style="list-style-type: none"> <li>- Demographic trends – ABS data such as links to 'Know Your Area'</li> <li>- Community information including community projects, and community organisations and identify relevant key people/contacts for researcher enquiries</li> </ul> <p>– local community building initiatives</p>	<p>ABS, DSE website</p> <ul style="list-style-type: none"> <li>- Landcare, top-crop, BCG, Wimmera development association, Wimmera CMA regional development initiative and other local groups</li> <li>- Department of Victorian communities</li> </ul>
<i>Economic/regional development</i>	<ul style="list-style-type: none"> <li>- Agri-business</li> <li>- Economic development</li> <li>- On-farm opportunities</li> <li>- Diversification</li> </ul>	<ul style="list-style-type: none"> <li>- WARM plan</li> <li>- Municipal strategic statements and planning schemes, where relevant.</li> </ul>	<p>Local councils</p>

*Other key resources* suggested by respondents included maps of local area, and nationally and internationally dryland regions, a glossary of key terms, links to other

related research institutes, and commonly used acronyms of organisations and of relevant terminology.

**Information from the affiliated water industry** in terms of links or contacts to all key water institutes, situated at local, national and international levels was of interest to seven participants. Ten participants were interested in accessing information on the knowledge base from government departments including key policies and policy updates related to water, local government information and departmental information. Most participants were interested in journals, for a few journal links were not a priority. The majority of participants were interested in a calendar of conferences, some indicating areas of interest, whilst a few participants mentioned that they have access to this kind of information via electronic newsletters.

In general, those that were not interested in this information felt it was beyond the scope of their organisation and therefore is not needed. Similarly, interested participants were concerned that this information is well targeted in order to retrieve information quickly and conveniently from the appropriate department, institute or journal. This could be effective, for example, if links to each department included an attached profile (so users know where to start searching on a particular topic) and if links went to specific background reports, rather than a generic website. Furthermore, participants were interested to have as many annotated references as possible and their source details adequately catalogued, so they may be found.

Participants gave many examples of the types of information to include on the knowledge base related to the affiliated water industry. These examples are detailed in table 2.

All organisations expressed interest in including information about their organisation's activities on the knowledge base, in particular project summaries and updates. There was also willingness from participants to host a link of the WIDCORP knowledge base onto organisational websites, where these were available.

In conclusion, people want information most relevant to their needs:

- Researchers within WIDCORP require information across social, economic and environmental topics about water-in-drylands research relating to local, national and international resources.
- Water authorities and other R&D institutes (ie. DPI, BCG) are interested in understanding WIDCORP research programs and outcomes, and seek knowledge on lessons-learned from parallel communities facing similar changes. Some water authorities identified the need to engage with regional development and build knowledge in this area.
- Health services require social demographics, and are less interested in water-related information.

**Table 2: Affiliated water industry resources identified by WIDCORP members**

<b>Information type</b>	<b>Examples of resources to include</b>
<i>Water-related institutes</i>	<p><i>General comments</i></p> <ul style="list-style-type: none"> <li>- List of all key institutes with search tool by theme, or by organisation</li> </ul>
<i>Government</i>	<p><i>General comments</i></p> <ul style="list-style-type: none"> <li>- Policy updates on water sector, as difficult to keep abreast of issues</li> <li>- Policy documents with direct links to these</li> </ul> <p><i>Specific resources</i></p> <ul style="list-style-type: none"> <li>- “Our Water, Our Future”; “National Water Initiative” (policy documents)</li> <li>- Department of Agriculture, Fisheries and Forestry</li> <li>- Department of Mining</li> <li>- Department of Minerals &amp; Energy</li> <li>- Department of Primary Industries</li> <li>- Department of Sustainability – Heritage and environment</li> <li>- Land &amp; Water Australia</li> <li>- Murray Darling Basin Commission</li> <li>- Landcare</li> </ul>
<i>Journals/Publications</i>	<p><i>General comments</i></p> <ul style="list-style-type: none"> <li>- List of all journals related to water</li> </ul> <p><i>Areas/resources of interest</i></p> <ul style="list-style-type: none"> <li>- Maps of dryland regions in Australia and worldwide</li> <li>- ‘Facilitator’ –newsletter which covers issues in Landcare</li> <li>- ‘Waterlit’ database</li> <li>- Institute of Geographers</li> <li>- Charles Sturt University</li> <li>- CSIRO</li> <li>- Land &amp; Water Australia</li> <li>- Veridians –flora &amp; fauna</li> <li>- related to WM pipeline</li> <li>- related to climate change</li> </ul>
<i>Conferences/Events</i>	<p><i>General comments</i></p> <ul style="list-style-type: none"> <li>-Calendar of conferences/events and call for papers, with monthly updates</li> </ul> <p><i>Areas of interest</i></p> <ul style="list-style-type: none"> <li>Regional conferences – eg. Birchip Expo, Landcare</li> <li>Water, water development</li> <li>Wetlands</li> <li>Climate change</li> <li>Community development and sustainability</li> <li>Regional development</li> </ul>

#### **4.2 Identify knowledge needs of community and stakeholders audience**

Beyond the WIDCORP members, our objective is to ensure that the knowledge base provides an effective information exchange tool for knowledge users from a wider network of people and organisations which form our *community and stakeholders audience*. The proposed future work will:

- Identify, document and evaluate the key knowledge needs and issues of this audience.
- Inform and expand the existing knowledge-base to capture the knowledge needs of this user group.

In consideration of these issues, we aim to provide the opportunity for the community and stakeholders to build their knowledge and share and discuss their concerns/ideas and give feedback on water-related pipeline issues and current or proposed WIDCORP research projects. We also aim to provide the opportunity for the audience to increase their skills and knowledge on water advocacy, so that they are able to contribute to the decision-making processes around water.

Similar current interactive knowledge base initiatives, for example, Rural Law Online (<http://www.rurallaw.org.au/>), Birchip Cropping Group (<http://www.bcg.org.au>), are designed to increase knowledge and skills in a given area, as well as empower community members to seek, find and discuss particular topics, and further convert new skills/knowledge into practical application. It is WIDCORP's vision that our knowledge base will include this kind of interactivity. For example, it will include plain language information that is useful for the community and stakeholders, and that has a contribution and feedback mechanism to allow users to be involved in online forum discussions, add a document or link, comment on a report, provide structured feedback and contribute to 'in progress' activities.

#### **4.3 Identify knowledge needs of academic audience**

Another key audience of WIDCORP is related to academia and encompasses both the UB academic community including IRRRI, and UB's research centres (CHRP, CEM, CRIC, CIAO, CECC) and other research entities. Knowledge sharing between the academic audience and WIDCORP is paramount to promote our research credibility, increase our knowledge-sharing capacity between these knowledge rich partners, and increase our interactions with and contributions to the broader state, national and international research communities and decision-making processes related to water in drylands. This area of work will include (in its simplest form):

- Targeted interviews with the research centres to identify the knowledge needs of the academic audience including preferred method of communication and content requirements for the knowledge base, as well as knowledge sharing opportunities.
- Design interface for this component of the knowledge base and launch onto existing knowledge base.

Information from WIDCORP that is considered useful for this audience includes: a profile of researchers, summaries of current and proposed projects as well as working papers with a contribution and feedback mechanism, and publications. The knowledge base could also provide functionality such as allow users to monitor our research performance, be involved in online-forum discussions, add a document or link, comment on a research paper or project, provide structured feedback or contribute to 'in progress' research activities. These and other ideas will become apparent when an audit is conducted with the academic audience.

## **5 Conclusion**

The aim of the knowledge base is to provide an efficient and effective system for acquiring, storing and sharing knowledge. Knowledge includes information resources from 'out there', as well as knowledge people gain from experience. Building a community of practice around our knowledge topic will enhance the interactions among our audiences and provide a platform for more creative and extensive collaborations. Therefore the knowledge base is a key part of our communication strategy. The design of the knowledge base needs to reflect our audiences' needs, and knowledge that is important to WIDCORP's core business activities. The following options outline the possible forms and functions of this knowledge base.

### **5.1 Options for development of knowledge base**

The initial pilot phase of this project has identified the knowledge needs of our WIDCORP members. From this audit it is possible that WIDCORP can successfully develop a knowledge base which is user-friendly for this audience. Three options are

provided here all with differing levels of content, features, control and costs. (Some assumptions have been made to provide 'the ideal' scenario ie. Availability of information resources from organisations, employment of a 'knowledge support officer').

#### Option 1: WIDCORP specific

The objective of option 1 is to provide WIDCORP members with general information on WIDCORP's activities, facilitate collaboration among WIDCORP members, and awareness of the broader context of the water-affiliated industry, policy and practice. Whilst starting points are provided to external resources, users will be required to 'weed' through information to find what is useful to their needs.

#### *Content & Features*

- Provide WIDCORP information including project summaries, project results and research publications, profile of researchers, and proposed projects.
- Minutes of meetings, calendar of meetings for RAC & Board,
- Provide links to contact person from program partner organisations (and others?)
- Links to water institutes at local, national and international level, and links to other relevant institutes and journals at these levels.
- Post calendar of events/conferences related to our research areas.

#### *Control*

Knowledge base access is unrestricted, except for documents relating to governance (RAC and board committees).

#### Option 2: Regionally specific

Option 2 would have all features of the basic model in addition to those listed below. The objective of this option is to provide more locally-relevant current and historic information related to the triple-bottom line and to situate the local context within a national and global scale. The Corangamite CMA Knowledge Base (<http://www.ccma.vic.gov.au/>) provides a good example of the design features in this level.

#### *Content & Features*

- Database with search tools to help users find required objects or sources on the following knowledge (where possible):
- WM Pipeline project background and current information on stages, costs, water savings, water levels, people and organisations involved
- Lessons learned of parallel research, methods or applications of piped systems in drylands, or implications of major water infrastructure projects to rural communities at environmental, economic and social levels.
- Local information repository of the 'triple bottom line' theme (as mapped in table 1). Where documents are publicly available, electronic full-text copies may be linked to data entry; also source details will be posted for quicker access to reference. In addition, WIDCORP will develop an internal library with concurrent full-text resources for the local stakeholders and community to access.
- A contribution channel to allow easy linkage of new materials by any WIDCORP member
- Access to national policies on water, and water-related topics, and updates.
- Access to 'Waterlit' database for internal users
- Links to maps of dryland areas and links to GIS profiling maps of local WM regions.

- Information on the main knowledge support officer(s) (ie. to support users unfamiliar with the system) and a feedback mechanism on operation of knowledge-base.

#### *Control*

Restrictions of access may apply to WM pipeline information, and some local resources. 'Knowledge support officer' may be in charge of monitoring the quality, relevance, reliability and suitability of incoming knowledge to fit within standards. Subscription databases such as 'Waterlit' would have controlled access for University staff only, if managed through UB library. However the 'knowledge support officer' may search and retrieve items for a WIDCORP member on request.

#### Option 3: Advanced interactivity

The advanced option includes the two options above. This option also has greater interactive functions, more databases and increased search capabilities.

#### *Content & features*

- Includes *annotated* references and links ie. brief description of each data entry and link
- More powerful search tools across the knowledge base
- Extension of locally relevant information to include 'regional development' repository, if further investigation identified community need.
- Communication forums (eg. on documents in progress) to facilitate knowledge exchanges among WIDCORP member, and the capture of public exchanges for subsequent review and discussion.
- 'What's new' items broadcasted on the homepage
- GIS mapping of WM region and broader as specified by environmental PhD students

#### *Control*

Control criteria would carry forward from options 1 and 2.

## **6 Recommendations**

The following recommendations are proposed in order to guide the development of the knowledge base:

- 1 Agree upon a set name for the knowledge base to reflect the knowledge topic and WIDCORP core business.
- 2 Establish a knowledge base policy to set boundaries around our core organisational activities and knowledge topic. This policy will ensure knowledge users and distributors have clear, accessible guidelines as to how knowledge is shared, synthesised and managed through the knowledge base.
- 3 Create a knowledge map to visually categorise and classify knowledge valued by WIDCORP and its audiences, to provide a structural framework on which the knowledge base may operate.
- 4 To conduct a 'trial project' of knowledge base, focusing on the knowledge-needs of the WIDCORP members
- 5 Identify (a construction and ongoing maintenance) budget for each of the knowledge base options to determine which one is viable.
- 6 Select one of the three options (or an amended/alternative version) to develop a knowledge base based on this trial project and linked to our website.
- 7 Write a project plan for trial project of knowledge base including processes involved for implementation (see 'proposed project plan' attached).
- 8 Seek expert advice on development and implementation of knowledge base from CECC and arrange for select tender to set-up knowledge base.
- 9 Elect and arrange training for 'knowledge support officer' to maintain and manage knowledge base.

## 7. References

1. Debowski, S., *Knowledge Management*. 1st ed. 2006, Milton, QLD: John Wiley & Sons Australia.
2. Zboralski, K. and H.G. Gemunden, *The Impact of Communities of Practice*, in *Encyclopedia of communities of practice in information and knowledge management*, E. Coakes and S. Clarke, Editors. 2006, Idea Group Reference: Hershey, PA. p. 218-223.
3. Coakes, E. and S. Clarke, *The concept of communities of practice*, in *Encyclopedia of communities of practice in information and knowledge management*, E. Coakes and S. Clarke, Editors. 2006, Idea Group Reference: Hershey, PA. p. 92-96.
4. Wenger, E. *Supporting communities of practice: Executive summary*. 2001 [cited 2006 July 5]; Available from: [http://www.ewenger.com/tech/executive\\_summary.htm](http://www.ewenger.com/tech/executive_summary.htm).
5. Denning, S. *What is knowledge management?: A background paper to the World Development Report 1998*. 1998 [cited 2006 8 May]; Available from: <http://www.stevedenning.com/knowledge.htm>.
6. Owrang O, M.M., *Discovering implicit knowledge from data warehouses*, in *The encyclopedia of communities of practice and knowledge management*, E. Coakes and S. Clarke, Editors. 2006, Idea Group Reference: Hershey, PA. p. 131-137.
7. National Land & Water Resources Audit and ANZLIC, *Natural Resources Information Management Toolkit: building capacity to implement natural resources information management solutions*. 2003, National Land & Water Resources Audit and ANZLIC - the Spatial Information Council on behalf of the Australian Government: Canberra. Version 1.0 - November 2003. p. 19.

## 8. Appendices

### Appendix A WIDCORP Audiences: Excerpt from 'WIDCORP Communication Strategy, May 2006 – Draft'

There are three main audiences of WIDCORP which are 1) the *WIDCORP members*, 2) the *community and stakeholders*, and 3) the *academic audience*. Each audience is now described below.

#### *WIDCORP members*

The *WIDCORP members* are the network of people and organisations that form the internal structures of WIDCORP. It is important to communicate on a regular basis the progress and findings of WIDCORP's research objectives and WIDCORP's general business to these people and organisations, in particular to the *program partners, governance board* including an independent board chair, and the *research advisory committee* of WIDCORP. This includes involvement from representatives of various groups across the Wimmera-Mallee region. In particular, there is representation from:

- the community;
- GWM Water;
- Consortia of Catchment Management Authorities (CMAs) – Wimmera, Mallee, North Central and Glenelg Hopkins;
- Wimmera Uniting Care;
- Victorian Department of Sustainability and Environment (South West Region);
- Department of Primary Industries;
- University of Ballarat, in particular the Director of Institute for Regional, Rural Research and Innovation (IRRI), the Deputy Vice-Chancellor (Academic & Research), the Head of Western Campuses, as well as directors of the Centre for Health Research and Practice (CHRP), Centre for Regional Innovation and Competitiveness (CRIC); Centre for Environmental Management (CEM) and; Centre for Informatics and Applied Optimisation (CIAO)
- Wimmera Development Association; and
- Birchip Cropping Group.

Communication between *the research team* and other WIDCORP staff (i.e. program development manager and personal assistant) is also vital. The *research team* includes the director, research fellows and students (PhD and honours levels).

#### *The community and stakeholders*

The '*community and stakeholders*' are also part of WIDCORP's audience and encompass people and organizations from primary industries (including agriculture, mining, tourism and service industries) natural resources management, welfare, government, research, economic development, and community groups. The extent that this audience is contacted, involved, and kept informed is variable, and is dependent on the relevance of information to each individual group. They include, but are not limited to, the following which operate at a number of different levels:

- *Local level* including local councils, governing/decision making bodies, farmer groups (i.e. Birchip Cropping Group, Victorian Farmers Federation (VFF)), primary industries (i.e. agricultural, mining, tourism and service) welfare organisations (i.e. Wimmera Uniting Care), indigenous communities, special interest groups (i.e. Country Fire Authority (CFA), environmental groups, business and economic development groups (such as Wimmera Development

Association, Wimmera 2020, Drought recovery planning group), local landholders, other private enterprises, and the local and regional community as a whole.

- *Regional level* including regional development organizations, Indigenous Land Corporations and catchment management groups (statutory and non-government).
- *State level* including state government and their agencies (ie. Department of Sustainability and Environment (DSE), Department of Primary Industries (DPI), Parks Victoria, EPA Victoria, Regional Development Victoria (RDV)), state associations representing industry, non-government organizations, community groups and movements.
- *National level* including the Commonwealth Government and its agencies (i.e. Department of Agricultural, Fisheries & Forestry (DAFF), Department of the Environment & Heritage (DEH), Department of Sustainable Communities (DSC), Department of Transport & Regional Services (DoTaRS), Grains Research and Development Corporation (GRDC), National Water Commission, Rural Industries Research and Development Corporation (RIRDC)), inter-governmental forums, and national associations representing industry, non-government organizations (i.e. National Heritage Trust), community groups and movements.

#### *Academic audience*

The *academic audience* is integral to WIDCORP's audience base, as WIDCORP itself is essentially a research centre. Therefore communication in and between various tiers of the UB academic community of researchers and further a field (other research entities) are paramount to promote our research credibility, increase our knowledge-sharing capacity, and increase our contributions to the broader state, national and international research communities and decision-making processes related to water in drylands. The academic audience includes:

- The *UB academic community* including IRRRI, Centre for Health Research and Practice (CHRP), Centre for Regional Innovation and Competitiveness (CRIC), Centre for Electronic Commerce and Communication (CECC), Centre for Environmental Management (CEM), and Centre for Informatics and Applied Optimisation (CIAO).
- *Other research entities* including at the national level – CSIRO (Land and Water), Charles Sturt University (Institute for Land, Water and Society), Land and Water Australia, and the Australian Institute for Sustainable Communities. At the international level, includes possible communication with: International Centre of Excellence in Water Resources Management (ICEWaRM) and International Water Centre (IWC), in Australia; International Water Management Institute (IWMI), in Sri Lanka; International Water Association (IWA), in the UK; Stockholm International Water Institute (SIWI) in Sweden; World Water Council, in France; and the World Health Organisation (Water, Sanitation and Health) in Switzerland.

## **Appendix B Auditing knowledge need of WIDCORP members – Cover letter, Questions**

### **Cover letter**

(Emailed to WIDCORP member contacts)

WIDCORP is currently developing a proposal for building a structured knowledge base to be launched onto our website at [www.widcorp.com](http://www.widcorp.com)

The knowledge base will in its initial phases operate as a database. It will house public access documents including key reports, maps, news articles, project summaries and the likes for all users. In the longer term, WIDCORP's vision is to improve the capacity of the knowledge base to be more interactive so that users, for example, may participate in online-forum discussions, provide feedback on projects and access interactive maps.

One of WIDCORP's main aims is to provide relevant tools and information for WIDCORP members, our local community and stakeholders, and its academic audiences. As a ....(program partner)...., we would like to ask for your input into developing this knowledge base, in relation to suggested topics for inclusion.

As discussed with Pam McRae Williams (WIDCORP director) and on behalf of WIDCORP, I would like to talk to you about your ideas. Please indicate by email a convenient time for me to contact you next week by phone. It should only take about 15 minutes to complete.

I have attached the questions that I will be discussing with you. If you prefer, you can email your response using these questions as a guide.

With kind regards,  
Imogen Schwarz

### **Questions**

- What information, if any, from WIDCORP would you like to be able to access on this knowledge base?
  - Project progress summaries
  - Media releases
  - Research publications
  - Profiles of researchers
  - Working papers
  - Other
- What locally relevant information on the Wimmera-Mallee Pipeline project, or anything else, would you like to be able to access? Does your organisation have some of this material which we could access?
- What information from the affiliated water industry would you like to be able to access?
  - Links/artefacts/documents from Water institutes (local, national, international)
  - Links/artefacts/documents from affiliated government departments
  - Links to Journals
  - List of Conferences/Events

- Are there any other key documents that come to mind, which would be important to include?
- What information, if any, from your organisation would you like to have included on the information base? Eg. Annual reports, project overviews, information sheets
- Are there links/contacts that you would like to gain, but not sure where to find them and we could help you with this?
- Would your organisation host a link to WIDCORP's knowledge base?