GREAT ARTESIAN BASIN COORDINATING COMMITTEE

A RESEARCH PROSPECTUS FOR THE GREAT ARTESIAN BASIN

(as revised June 2009)

Purpose of the *Research Prospectus* [see www.gabcc.org.au for full text]

The Great Artesian Basin (GAB) is the world's largest fresh water artesian aquifer system and one of Australia's most important water resources. Landholders and governments have invested many millions of dollars in the GAB to rehabilitate bores, renew water delivery infrastructure and improve knowledge about the Basin and the benefits that it provides. With this investment comes the opportunity to improve GAB management and support the values attached to the GAB. However, our knowledge of the Basin is incomplete. Additional research is required on the structure, functions and values of the GAB, the infrastructure used to access GAB resources, higher value uses for GAB resources and GAB management and investment. The Great Artesian Basin Coordinating Committee, a national advisory group to government on management of the GAB, with representatives from all stakeholder groups, is well placed to work with research and funding organisations to encourage and facilitate priority research.

The aim of the *Research Prospectus* is to identify priority GAB research. It is hoped that the *Prospectus* will guide the preparation of new research proposals that provide an opportunity for researchers, industry and resource managers to collaborate in meeting the needs of the management of the Basin into the future.

In principle:

- research should focus on identified areas of strategic priority, and inform/influence practice and policy.
- research findings should be accessible to a wide audience, and
- cooperation should be maximised and duplication minimised.

In this context, research is defined as any form of inquiry seeking evidence to increase knowledge and includes activities that expand, clarify, reorganise and/or create knowledge. It includes not only traditional scientific research but also approaches like surveys, literature reviews, case studies, statistical analysis and focus groups.

Addressing the research questions

The GABCC has identified important knowledge gaps in a range of research areas. The GABCC invites potential researchers/contractors to provide proposals to address the priority research questions outlined below. These questions have been grouped under five themes: 1. Understanding the resource; 2.GAB access infrastructure; 3.Monitoring and measurement; 4.Higher values uses; and 5.Valuing investment and allocation.

This document outlines the questions in **theme 3: Monitoring and measurement**.

3. Monitoring and measurement

3.1 Pressure and spring monitoring

All jurisdictions have now completed a water plan for the GAB. All water plans have identified a requirement for monitoring pressure and environmental flows. Although monitoring is primarily the responsibility of the jurisdictions, information collected is required to support both Basin wide and local assessment needs under jurisdictional planning frameworks. Consistency in approach and data collected is pivotal to allow for any whole-of-resource assessment needs. Further investigation of monitoring approaches is needed to ensure future capacity to:

- integrate whole-of-resource and regional assessment needs;
- overcome cost prohibitive monitoring constraints (i.e. specific pressure monitoring bores); and
- accommodate the complexity of the GAB aquifer structure.

Priority research questions

a. What should the characteristics of the network be?
b. What are the deficiencies in the current data collected - where are the gaps?
c. What data should be collected in jurisdictional spring and pressure monitoring?
d. What data is needed to provide more accurate modelling, mapping and assessment capabilities within the jurisdictions?
e. How should measurements be carried out?
f. What is the most effective way of monitoring pressure as springs?
g. What is the most effective way to measure spring discharge?
h. What options/technology is available to remotely measure pressure recovery?
i. How do we engage landholders while maintaining the integrity of the data set?
j. How can data/reports from industry be used more effectively?
k. Who reports on what and to whom?
l. What is a reliable way to separate human induced change from natural changes in discharge from large spring complexes?
m. What are good biological indicators that indicate significant changes in natural diversity in and around springs?

3.2 Landscape change

Open drains have been removed from the landscape and replaced with closed piping systems through GABSI and private investment. The impacts of this change on the environment and the productivity of the land need to be measured or quantified.

Priority research questions

a. What effect does replacement with closed systems have on the environment and biodiversity?
b. What effect does replacement with closed systems have on productivity?
c. How do we measure these changes?

3.3 Accounting for stock and domestic use

Stock and domestic use accounts for the single largest use of water in the GAB. Even when all uncontrolled water bores are capped, stock and domestic use will still represent the largest use. There is now agreement between the Commonwealth and states that there will not be a requirement for stock and domestic use to be metered or to hold a volumetric entitlement. As a consequence, there is a need to identify and implement a robust methodology for measuring and accounting for stock and domestic use across the

GAB. This is pivotal to providing accurate data to support and inform future planning and management decisions.

Priority research questions

a. What are the jurisdictions' current approaches to estimation of stock and domestic use in the GAB?
b. What data is required to ensure accurate accounting of stock and domestic use?
c. What is an optimal method which can be standardised?
d. What can be done using remote technology?
e. Can landholders be involved in accounting for stock and domestic use?
f. What costs are associated with ongoing measurement of this use?

Further information

Partnerships

The Committee is not well placed to directly undertake research. However, the Committee is well placed to

- provide leadership and focus strategic research
- broker relationships within the research community and between industry, policy and research groups
- build a knowledge base, and
- communicate research to a wide audience.

Scholarships

The GABCC has established two PhD top-up scholarships, each valued at $5,000 per annum over three years. These top-up scholarships are intended to supplement the funding of primary scholarship holders who intend to conduct innovative research that will address priority research questions and themes identified in the *Research Prospectus*.

How to get involved

For further information on the *Research Prospectus*, potential for partnering or the PhD top-up scholarships, or to indicate your interest, please contact the GABCC Secretariat or complete a registration of interest form – see www.gabcc.org.au for further information.