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# **INTERJURISDICTIONAL ANALYSIS OF COMMUNITY- BASED GOVERNANCE ARRANGEMENTS FOR WATER RESOURCE MANAGEMENT IN WESTERN AUSTRALIA**

A report prepared for the Department of Water, Western Australia

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**HAMSTEAD**  
**CONSULTING**  
*PTY LTD*

ABN: 66 115 039 480  
ACN: 115 039 480

***Registered Office and Postal Address:***

11 Bates Ave  
Blaxland, NSW, 2774

***Contact details:***

Mark Hamstead  
Phone: 0438 006290  
Fax: 02 8212 8053  
Email: [mark@hamstead.com.au](mailto:mark@hamstead.com.au)

***Authors:***

Claudia Baldwin: University of Sunshine Coast [cbaldwin@usc.edu.au](mailto:cbaldwin@usc.edu.au)  
Mark Hamstead: Hamstead Consulting [mark@hamstead.com.au](mailto:mark@hamstead.com.au)  
Vikki Uhlmann: Vikki Uhlmann Consultancies [vuhlmann@bigond.net.au](mailto:vuhlmann@bigond.net.au)

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## EXECUTIVE SUMMARY

The West Australian (WA) government is considering community-based governance of irrigation as one possible way of meeting both irrigator needs and commitments under the National Water Initiative (NWI). Community-based governance is being investigated for application to areas of 'self-supply', where irrigators do not rely on a common water distribution system but access surface or groundwater individually directly from the source. This report informs the policy process by investigating seven case studies in Australia which feature a diverse range of characteristics of community-based governance.

The WA Government's Water Reform Implementation Committee (2006) indicated that community-based governance would have to meet minimum criteria for success before responsibilities would be devolved. Based on evidence-based policy and the case study review, this report makes recommendations for how such entities should be established, their roles and responsibilities, and resources required. It identifies some of the lessons learned about community-based governance in terms of benefits, barriers, risks, and contingencies.

The seven cases are: Central Irrigation Trust (SA), Abercrombie Pumping Association (NSW), Bega Valley Water Users Association (NSW), North and South Burdekin Water Boards (Qld), Winnaleah Irrigation Scheme (Tas), West Corugan Private Irrigation Board (NSW), and First Mildura Irrigation Trust (FMIT). They represent large and small memberships and three major entity types: water legislation entity; company limited by guarantee, and non-profit incorporated association. All are governed by a Board or committee of 6-10 elected from the membership. One also has representatives from local government and a local industry.

An important finding of the research was that the type of entity and structure was not directly related to the roles and responsibilities or delegated powers of entities. For example one non-profit organisation had major delegated responsibilities equivalent to water legislation entities, because its State legislation permitted it. If WA government supported the concept of community-based governance arrangements, it could build into legislation powers to delegate certain responsibilities to a non-profit company, cooperative or incorporated association via an operating licence or agreement. In many cases a simple incorporated association would be adequate even if there were some assets to be held in common and managed jointly such as telemetry or meters.

Most of the case study entities were developed for the purpose of supplying surface water to members for irrigation. Only the Burdekin Boards have a distinct resource management purpose – to replenish the aquifer. A number of the entities distribute water as a bulk entitlement holder to water users according to defined entitlements and manage water trading internally. Cases where government has delegated water sharing to a group of self-supply water users appear to be non-existent in Australia.

Effective water resource management is more likely to occur if rules are based on sound data and developed in collaboration with users. Involving entities and members in monitoring extraction and resource condition provides continuous feedback about the resource. While data about resource characteristics and use needs to be improved, there will always be levels of uncertainty, due to climate change and the complexity of natural systems. It is essential that users understand the system characteristics, impact of extraction, and these uncertainties, so that an adaptive management

approach is adopted. Water sharing plans set the principles and parameters of use and the means to meet obligations to the environment and other public benefits. A community-based governance regime can play an important role in providing for a collaborative approach to developing a water sharing plan, implementing, reviewing and adapting rules over time. Governments and irrigators may need to adjust to establishing a long-term collaborative relationship with each other.

Most of the case study entities had the ability to impose penalties and/or cut off supply if members did not comply with allocation rules. In large organisations where staff are employed to monitor and ensure compliance, this is quite appropriate. However in smaller groups, a preferred approach for self management entities might be for them to have the ability to warn the member and arrange redress by local arrangements, but have the option to report illegal take to a government agency for enforcement where this fails thus separating the compliance role.

All of the case study entities were supported by fees or levies on irrigators, based on a flat membership fee, unit of entitlement, area used for irrigation, or volume of water used. The level of charges was related to the responsibilities of the entity and the number of staff to discharge the responsibilities. The largest had a budget of \$8.2M and a staff of 31; the smallest a budget of \$3000 to cover administrative costs. All were fully self funded for their ongoing operations, though several obtained government grants to contribute to particular projects (eg CIT's metering upgrade).

It is clear that community-based entities can form and fund themselves. They do not need permission of government. However government can legitimise and support their roles by recognising them in legislation, delegating powers, engaging them in development of plans, sharing data, and by providing support for training and transition activities. Such entities can also foster credibility and leverage resources by collaborating with government, research agencies, and regional natural resource management bodies.

The main benefits of community-based arrangements are providing a mechanism to engage irrigators in developing rules for water sharing and gain their commitment to management of a common water resource in an empowering way. It may be the first time that a group of irrigators have collaborated with each other to manage water. It recognises their expertise and knowledge and allows flexible management within overall constraints of a water sharing plan. If effective, it reduces the operational demands on government, facilitates commitment and innovation at a local level and engenders a culture of compliance with rules which are seen to be fair and reasonable.

The main risks are twofold. First, the costs of operating such an entity may not be seen by irrigators to be worth the benefit, particularly in a self-supply system. If the entity is engaged well by government in developing the 'rules' (through a water sharing plan) then irrigators may not want additional responsibilities. On the other hand, irrigators may also want control through metering, monitoring and compliance. Overseas studies have shown that successful self-governing entities have major roles in monitoring and compliance. The second risk is from the WA government's perspective. There is a risk that the entity will not cooperate in meeting its obligations under a Plan and therefore the State government will not meet its obligations under the NWI. At the same time, there is no guarantee that government could manage the resource better or achieve effective compliance without concurrence of the irrigators.

To address the risks from both parties' perspectives and to be successful, community-based governance needs to be formalised, rules (a plan) established in a transparent and inclusive way, and responsibilities accepted and funded within the capacity of the irrigators to support them. Water user leadership needs to encourage collaboration among irrigators, and between irrigators and government. Incentives for collaborative water management might include: more clearly defined entitlements; better understanding of reliability of supply (particularly in over-used systems); and tradeable water entitlements.

## **GLOSSARY OF TERMS**

Co-management – community-based management of natural resources where members are empowered and have a legitimate role in taking responsibility for management of the resource

Entity – a group that manages irrigation supply eg water authority, water user association, trust, non-profit association. Members may be referred to as water users, irrigators, members, or growers depending on the case.

Self-supply water users –individual water users tap the water resource independently

Water legislation entity – a body which relies for its existence as a legal entity on state water legislation.

# INTRODUCTION

## CONTEXT

The West Australian (WA) Government is in the process of developing a statewide policy on ‘self-management’ and to investigate its application in South West of WA. It is looking at the options of application of community-based governance to areas where irrigators do not necessarily rely on a common distribution system for access to irrigation water, such as in areas of groundwater extraction or where individuals self-supply from rivers and streams (often with small on stream dams). In these cases individual landholders have traditionally supplied their own infrastructure independently to use and manage underground water below their land, with minimal involvement of government.

Historically the focus of government water agencies in Australia has been on managing surface water supplies for urban and irrigation use. With increasing pressure on groundwater resources for irrigation over the past 30 years and a nation-wide commitment to the National Water Initiative (NWI), jurisdictions have been examining various ways of introducing improved water management. Groundwater management involves certain challenges:

- Hydrogeological boundaries and movements are not visible nor easily mapped;
- There is uncertainty about the effect on neighbours (within and between aquifers) and on surface water flows (surface-groundwater connectivity).
- Landholders have invested directly in providing their own water supply through drilling bores and supplying their own pumps and pipes.
- Government has traditionally not been involved in licensing, metering or monitoring use.

The WA Government’s Water Reform Implementation Committee identified a need to increase self-management of water resources in areas where substantial irrigation occurs as part of its report on a Blueprint for Water Reform. Recommendation 64 specified that ‘For any water management functions that are devolved to community management groups, that statutory water management plans pay regard to the criteria essential for success and clearly articulate where the community groups’ authority starts and finishes’ (WA WRIC 2006). The Government of Western Australia endorsed further investigation of the concept through its Implementation Plan, indicating that ‘where it is cost-effective and where the community has the desire and skills to do so, some activities currently undertaken by the DoW may be devolved to such groups’ (GoWA 2007).

## PURPOSE OF STUDY

The objective of this undertaking, as identified by the WA Department of Water, is to conduct research into existing examples of community based governance arrangements for water resource management in other Australian jurisdictions for applicability in Western Australia. The research is to inform and assist in the development of case studies being undertaken in the South West of WA and ultimately the development of a Department of Water policy position.

The analysis provides a detailed overview of each governance model type including key characteristics and information on funding arrangements, delegations from state bodies (e.g. department responsible for water resource management for the jurisdiction), and structural details including governance and membership, as required in the Terms of Reference (GoWA 2008).

## SCOPE

The analysis covers the following areas within the constraints of current and proposed water resources management legislation in WA:

- a) Governance models using examples from Victoria, South Australia, Queensland, New South Wales and Tasmania;
- b) The costs involved in the establishment of models identified and the ongoing operational costs, including discussion on how costs are recovered;
- c) Legislative models in jurisdictions that enable the creation of different community-based governance models;
- d) Summary of common factors that underscore the success of models including operations and design principles;
- e) Drivers of self-management models;
- f) Barriers to self-management; and
- g) Lessons learnt in other jurisdictions.

'The analysis is to be desktop based research, with no inter-jurisdictional travelling required to complete the task' (GoWA 2008).

## COMMUNITY-BASED GOVERNANCE

WA's Water Reform Implementation Committee (2006) identified three self-management models that currently operate in the irrigated agriculture industry: a corporate structure, a cooperative structure and a water management committee under the *Rights in Water and Irrigation Act 1914*. It reported that common factors underscoring the success of irrigation cooperatives across Australia are:

- A clear common interest
- Well defined property rights, responsibilities and accountabilities
- Ability to trade water amongst members and some collective control on trading water outside the cooperative
- Security of water access
- A sound skills base for management
- Incentives to support the transition from a government entity to a sustainable self-managed entity

(WA WRIC 2006, p 4).

## EVIDENCE-BASED POLICY

Recent reviews related to water reform and irrigation in WA indicate that irrigation cooperatives have provided an effective basis for water management, maintenance of shared assets, and support for a range of best practices (GoWA 2005, 2005). Benefits of self-management of water by irrigation cooperatives have been well documented (WA WRIC 2006; Ostrom 1992, 2005; Marsden Jacob Associates 2004). There is also substantial literature that shows that resource users can effectively manage common pool resources (such as water) within a nested framework supported by government (Ostrom 1990; McKean 1992; Bromley & Cernea 1989).

Based on hundreds of local and regional case studies from around the world, principles and models for self-governance of common-pool resources, such as groundwater, have been developed (Ostrom et al. 1999; Ostrom 2005; Ostrom and Nagendra 2007). Ostrom and colleagues identified eight basic principles that lead to cooperative behaviour as follows.

1. *Clearly defined boundaries.* The people holding access rights are clearly defined as well as the territory to which the rights applied, thus providing certainty about what is being managed and for whom.
2. *A match between contribution and benefits.* Community-based management requires investment in time, effort, and often financial resources. To be long-enduring, participants must feel that they receive an equitable benefit from their contribution. So processes must be designed to ensure equity and fairness.
3. *The right to make and adjust rules.* In many of the successful regimes studied, the right to make changes to the rules under which the system operates was limited to the members, those people affected by the changes. Users who feel that rules or changes are not made in response to local conditions, or do not match their needs, may simply ignore them. Any changes to the system must make sense in order for members to continue investing in it.

While the first three principles deal with institutional operational rules, the next set deal with more familiar aspects of resource management: monitoring, sanctions and conflict resolution, but vary from a typical top-down style of management.

4. *Monitoring* – Those who monitor are either the members/users, or report back to the users. Data that is useful to users is collected and they decide what information would be useful.
5. *Graduated sanctions* – Infringement of rules occurs in any system. Successful co-management systems were found to have a graduated system of sanctions, from a warning for a first contravention, through to loss of access to water or loss of membership for serious or continual disregard of the rules.
6. *Conflict resolution* – As with infringements, conflicts are inevitable, particularly when there may be ambiguity in rule interpretation or a rapidly changing system. Successful systems used local methods with limited costs to resolve internal conflicts, frequently as part of a leader's role. However conflict resolution mechanisms can be informal or more formal with decisions being recorded.

The last two principles involve features external to the body - recognition and nesting.

7. *Recognition of the legitimacy* of the self-management system by government authorities and by other resource users. Without formal recognition it is difficult

8. *Nested enterprises* – Some but not all bodies may be nested within regimes that operate at larger scales such as regional or state levels and provide additional support (Weinstein 2000).

These principles represent some themes for design of community-based management of water resources and, in combination with WA policy paper recommendations, were used to structure our review and analysis.

The recommendations of the WA Water Reform Implementation Committee reflect many of Ostrom's principles. It emphasises that self-management must be within a government framework such as a statutory regional or sub-regional water plan and that a self-managed organisation must be accountable (and face sanctions) for its regulatory performance. The Committee suggested that for water management committees to evolve into a self-management structure certain conditions would need to be in place:

- a statutory water management plan (and probably a land use plan)
- understood set of boundaries
- knowledge of the system
- defined set of internal structures
- local participation in the governance of the committee so that imposed, graduated sanctions are accepted by local water users
- financially independent, implying the need for the power to raise a levy on water
- need for conflict resolution mechanisms
- need to be accountable for its performance via monitoring and enforcing entitlement conditions  
(WA WRIC 2006, p 17).

In referring to cooperatives, the WA Committee contributed three additional factors which need to be considered:

- A clear common interest
- Ability to trade water amongst members and some collective control on trading water outside the cooperative
- A sound skills base for management.

A study comparing collaborative groundwater governance of case studies in Spain and Australia (Namoi and Lower Murray) with Ostrom's principles (Ross and Martinez-Santos n.d., p 17) found the following:

- Sustainable yield is often debated because of lack of long-term data on extraction and aquifer levels, therefore there is a need to get parties to accept scientific uncertainty and agree to adaptive management (iterative solutions) through ongoing engagement.

- Intervention by government has been unpopular due to the individual investment in an expected reliable scheme and past self or no management of the resource. User group leadership was found to be important.
- Support of user groups is essential yet has been complicated by lack of shared perceptions and trust between participants. Transparent and inclusive consultation is necessary to achieve collaborative solutions. Effective enforcement of rules by government is unlikely without user group collaboration.
- Users need an incentive for collaborative water management. Incentives might include: more clearly defined entitlements; better understanding of reliability of supply (in over-used systems); tradeable water entitlements, and compensation for reduced entitlements.

More recently, Ostrom and Nagendra (2007) have also emphasised the need for monitoring. They suggest that when users are genuinely engaged in decisions about rules affecting their use, there is greater likelihood of them following the rules and to monitor others, than when an external authority simply imposes the rules.

One of the challenges is to tailor community-based arrangements to suit the individual situation, particularly in self-supply areas where infrastructure has not provided irrigators with a common interest to date. The effectiveness of groundwater management will rest on the rules being transparently and collaboratively developed.

## **METHODOLOGY**

The research was based on analysis of 7 case studies of existing community based governance arrangements in Victoria, South Australia, Queensland, NSW, and Tasmania. The basis of analysis was a desk-top review of legislation, policies, annual reports and other documents relevant to each case study. This information was supplemented by telephone interviews with government agencies and existing members of community-based water management organisations. A consistent set of questions and approach was used to gather information on the nature and operation of the organisations and perspectives on successful aspects and areas for improvement.

The identification of attributes investigated in each case study and design of the approach was based on international literature on:

- principles for self-governance of common-pool resources (Ostrom 1992, 2005);
- a framework for analysing attributes and their effect (Ostrom 2007);
- steps for conducting policy analysis of comanagement systems (Carlsson and Berkes 2005, p65); and
- evaluation literature focusing on process and outcome features.

Each case study was analysed using agreed attributes shown to influence the effectiveness of community-based management, thus providing a solid foundation for evidence-based policy. These include:

- Boundary definition (easily defined in irrigation distribution systems, not as easily in groundwater regimes)

- Characteristics of the area: history, drivers for establishment, socio-ecological system, issues
- Purpose of the entity such as water distribution infrastructure; water management (e.g. groundwater); security and efficiency initiatives; water plan development; transfer of licences
- Governance, accountability and transparency arrangements: legal structure; community support; participants and membership eg water users, other relevant stakeholders, government agencies
- Roles and responsibilities: Scope of tasks such as maintaining infrastructure; monitoring use, aquifer level and water quality; methods of rule-making; communication within group and between group and government; compliance, sanctions and incentives; dispute resolution
- Funding arrangements: establishment and operational costs, cost recovery, costs and benefits
- Participatory arrangements: water users, other relevant stakeholders; general community
- Water entitlement arrangements: ownership, rights and responsibilities of individual water users as against the organisational entity
- Recognition of the body through delegated authorities from government or by other means
- Organisational and spatial linkages and nesting
- Human resources and capacity

The case studies as a whole were then analysed according to the following themes:

- Drivers
- Framework for operation – governance, institutional arrangements
- Boundaries
- Knowledge of resource (including monitoring)
- Roles and responsibilities
- Legitimacy (recognition, decision-making, accountability and conflict resolution)
- Compliance
- Resources: costs and cost recovery and human resources; and
- Lessons learnt about community based governance: benefits, barriers, risks and opportunities.

On this basis, the research identifies the implications for adoption of possible models in Western Australia.

## **SELECTION OF CASE STUDIES**

The original 6 case studies were chosen in consultation with the Department of Water to represent a range of different governance structures, approaches in different States, to include both surface and groundwater systems and groups with small numbers of

irrigators. The Winnaleah Irrigation Scheme Ltd in Tasmania was substituted for Clyde Irrigation Trust because it is a more recent institutional model that better reflects user-preferred arrangements than the much older Trust model, and Clyde Trust has had its operational water sharing role suspended for the last several years. A further case study was added part way through to capture a smaller entity with less formal arrangements which might be more suitable for a WA district, bringing the total to 7 case studies. While the Lockyer co-management proposal is referred to in the report it was not used as a case study because the approach is still under development and subject to agreement between the Lockyer Water Users Forum and Queensland government.

**Table 1: Case studies and characteristics**

Case study	State	Size of membership	Scope
1. Central Irrigation Trust (CIT)	SA	1500 (in 10 Irrigation Districts)	Distributes water from Murray River using large diameter pipes to irrigate 14,000ha; also supplies to urban and industry.
2. Abercrombie Pumping Association	NSW	Eight	Administers an open channel scheme supplying water for irrigation, stock and domestic use to 12 properties (total area 200,000 ha) from headworks on the Murrumbidgee River.
3. Bega Valley Water Users Association	NSW	65	Represents irrigators in the Bega River Catchment (2000 km <sup>2</sup> ).
4. North and South Burdekin Water Boards	Qld	650 (combined)	Manages the replenishment of the aquifer system using flows from Burdekin River with 26,222 ha benefited from irrigation
5. Winnaleah Irrigation Scheme Ltd	Tas	37	Administers a piped scheme supplying water for irrigation to 60 properties, and for domestic use to two towns and a further 200 properties, within an irrigation district of 5000ha.
6. West Corugan Private Irrigation Board	NSW	250	Manages distribution of water from Murray River through open irrigation channels to irrigate 212,000 ha.
7. First Mildura Irrigation Trust (FMIT)	Vic	2559	Delivers irrigation and drainage services for irrigating 6750 ha

Most of the case studies relate to instances of community rather than government management of shared water supply infrastructure. This is very common. However cases where government has delegated its normal role in administering water sharing to a group of self supply water users are almost non-existent. The Burdekin Water Boards include an element of self supply, in that many landholders within the Board's area of operations take their water from the aquifer system rather than from surface channels (surface and groundwater are highly interconnected). Bega Water Users Association goes part way down this track, with a role of facilitating establishment of water sharing arrangements for self supply from rivers, but still relies on government for operation and compliance.

While none of the case studies provide an exact match for what is envisioned as possible in WA in terms of scope, they still provide useful examples of most of the characteristics that would apply (eg governance arrangements).



Figure 1: Case study locations in Australia

## INTERVIEWS, INTERVIEW GUIDE, AND CONTACT DATABASE

For each case study, one to two key informants were interviewed by telephone from:

- the organisation such as the Chair or senior executive;
- the government department with the closest relationship; and/or
- a water user or community stakeholder.

These people were identified by existing regional contacts, the organisation's website, or recommended by others. Initial contact was made by telephone. After a basic introduction, a time was organised for the interview and the attached Information Sheet (Appendix One) was emailed prior to the interview taking place. Interviews tended to take approximately 40 minutes. The Interview guide (Appendix Two) was developed to cover the range of attributes and issues but was modified by the interviewer in practice depending on the person being interviewed and the information already gained from the internet and available documents.

A database was compiled of contact details for each of the case study organisations in case the WA Dept of Water wants to follow-up on any information and supplied separately. . Individual case studies are described in Appendix Three.

## LIMITATIONS

The study scope sought a desk top review within a short time frame. As a result, a number of factors influenced the results:

- Information was based on data available on the web or available to be sent electronically.
- Maps used were those accessible electronically and were used to identify location of the entity, not to identify property or irrigation system details, as this was not pertinent to the study.
- Interviewees were those available at the time of the study and provided information within their time constraints.
- Interviewees offered perspectives based on their experience and provided information to the best of their knowledge but it was not always detailed.
- Terminology to describe governance arrangements and irrigation systems was inconsistent between states.

## ANALYSIS OF CASE STUDIES

### FRAMEWORK FOR OPERATION

#### General Explanation

*A draft blueprint to water reform in Western Australia* (WA WRIC 2006) indicated that a self-management entity should have a defined set of internal structures. It identified three models by which increased self-management could be delivered, depending on local circumstances: corporate structure, cooperative structure, and a water management committee. The terms of reference required assessing pros and cons of three entities: corporation, cooperatives and committees.

The types of entities in the case studies were:

- companies limited by guarantee;
- incorporated associations; and
- entities established under the provisions of water legislation.

#### Companies Limited by Guarantee

A company limited by guarantee is incorporated under the *Corporations Act 2001* and registered with the Australian Securities and Investments Commission (ASIC). As a company it is a legal entity capable of owning property, suing and being sued. Companies limited by guarantee are intended to be non-profit making entities. Unlike normal companies, there are no shareholders. Instead there are members who have voting rights, but to whom company profits cannot be distributed. Apart from a nominal amount, the members cannot be held liable for debts etc should the company fail or be sued (ASIC 2008).

The rules of operation of a company are established in a constitution which is determined by the members of the company, subject only to guidelines and requirements under the *Corporations Act 2001*. For a company limited by guarantee the non-profit nature of the organisation has to be explicit, with specific clauses that refer to the winding down of the organisation and the distributions of funds to similar non-profit organisations with no distribution amongst its members (otherwise they would be for profit).

Winnaleah Irrigation Scheme, for example, was established so that, through its constitution:

- it is for non-profit purposes only - its income can only be applied to promoting those purposes
- members of the company are only liable for their \$10 holding in the company
- the company cannot make distributions to its members.

This model was chosen for Winnaleah based on advice from an accountant for these reasons:

- taxation advantages of a non-profit organisation
- limited liability and capability of owning property afforded by being a company
- voting rights of members
- ability to attract government contributions for capital investment because there can be no windfall capital gain to irrigators.

### **Incorporated Association**

Any club or association can be incorporated under state or territory legislation (eg *WA Associations Incorporation Act 1987*) by a straightforward process involving not much more than lodgement of an application with a set of rules for the association's operation and governance.

An incorporated association is a simple and affordable means of creating a separate legal entity for community based groups with limited resources. The main advantages of an incorporated association are:

- it is a non-profit organisation
- it is a separate legal entity capable of owning property and employing people
- it continues regardless of membership changes
- it provides financial protection to members by limiting personal liability to outstanding membership fees
- it is simple to establish and operate
- it has minimal statutory reporting obligations and is not scrutinised to the level of registered corporations or cooperatives. They do not, for example, require fully audited accounts or have to provide annual returns to government agencies.

Incorporated associations generally need to:

- have a management committee
- hold an annual general meeting

- keep minutes of all meetings and proper accounting records

(DOCEP WA 2008; FT NSW 2008; AUCD 2008).

The lower level of scrutiny and simpler management arrangements lends itself to small non-profit organisations. More tightly managed and scrutinised arrangements such as companies or cooperatives are more relevant where the financial or other risks are higher. They are typically expected where significant external funding is sought and government or other investors desire a higher level of accountability.

Bega Valley Water Users Association for example chose to incorporate approximately 15 years ago. The main reason was to limit liability for office bearers and members, the decision being taken based on advice from an accountant. Winnaleah on the other hand chose a company limited by guarantee because it enabled attracting government grants, albeit with the higher level of financial scrutiny.

A committee involved in co-management would most likely operate as an incorporated association.

### Cooperative

A cooperative is an association of persons united voluntarily to meet their common aspirations through a jointly-owned enterprise democratically-controlled by its members, who use its services or who work at it. A defining point of a cooperative is that the members have a close association with the enterprise as producers or consumers of its products or services, or as its employees.

While in its general sense any group of people can form a cooperative venture, formal cooperatives are entities registered under state cooperatives legislation. They have generally similar requirements to companies in terms of financial accountability. The main difference is that cooperatives exist for the mutual benefit of the members, who must retain a close association with the cooperative enterprise, rather than for commercial benefit of share holders who are investors. Voting is per member rather than per share.

Co-operatives can be established with either a 'trading' or 'non-trading' structure. Trading cooperatives allow distribution of profits to members. These benefits are distributed proportionally according to each member's level of participation in the cooperative, for instance by a dividend on sales or purchases, rather than divided according to capital invested. Non-trading cooperatives prohibit distribution of profits, requiring profits to be retained within the cooperative.

While none of the case studies were constituted as cooperatives<sup>1</sup>, CIT, Winnaleah and Burdekin Boards are grower owned and operate in accordance with many cooperative principles. Most of the case studies had boards that were democratically elected by the membership. While information was not available on why Winnaleah chose a company limited by guarantee rather than a cooperative, one possible reason would be that Winnaleah provides domestic water supply services to a substantial group of landholders who are not company members.

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<sup>1</sup> One of the options proposed for a case study to represent a cooperative structure was Colleambally Irrigation in NSW, however the Dept of Water indicated that this should not be selected as there was already sufficient analysis on similar cooperatives in WA (eg Harvey Water).

## Water legislation entity

Central Irrigation Trust, First Mildura Irrigation Trust, West Corugan Private Irrigation Board and North and South Burdekin Water Boards are entities which are created under the provisions of state water legislation. Typically they are created by proclamation by the Governor and can be dissolved in the same way. Effectively, their ‘constitution’ is set out in the legislation or regulations and is thus fairly inflexible. Such things as processes for establishment, appointment of board members, purpose, meetings, functions, reporting and record keeping requirements are set out. However details vary from state to state.

In each case the legislation gives them the status of a corporation, allowing them to own assets, employ people, sue and be sued; though the legislation also may limit their ability to do such things as borrow funds. They also have statutory powers to do such things as raise rates or levies, enter land, or construct works which are likewise prescribed in the legislation.

From a water user’s point of view, the main advantage of this structure is the statutory powers given to the entity. The disadvantages are the inflexibility of the governance arrangements and the higher level of Ministerial powers to intervene in their governance and operations (though this varies depending on the specific provisions in the respective state legislation).

The advantage of having access to statutory powers can be provided in other ways. Winnaleah in Tasmania for example chose not to become a trust under the Tasmanian Water Act because it was considered to be a less flexible arrangement than a company limited by guarantee. They are nonetheless given delegated statutory powers to enter or construct works using general powers of delegation in the Act.

## COMPARATIVE ANALYSIS

The case studies illustrate a range of governance options as companies limited by guarantee, water legislation entities, or non-profit incorporated associations, developed to suit the individual situation. Each entity is governed by a board or committee elected by and from the irrigator membership, except in the case of the Burdekin Boards where local government and the mill industry are also represented on the Board because of the investment in entity operation and infrastructure. While roles and responsibilities are discussed later, all of the entities but one were established to deliver or provide access to water from one source to its members. The Burdekin Boards were primarily established to manage the groundwater resource.

**Table 2: Framework for operation**

Case study	State	Entity type	Executive
1. Central Irrigation Trust (CIT)	SA	Water legislation entity: Irrigation trust under <i>Irrigation Act 1994</i>	Board of Directors: a representative elected from each of 10 irrigation districts.
2. Abercrombie Pumping Association	NSW	Non-profit incorporated association	An executive committee of 6 elected by and from the members.
3. Bega Valley Water Users Association	NSW	Non-profit incorporated association	A management committee of elected member representatives from each of the 8 rivers within the Bega catchment and an

			honorary secretary
4. North and South Burdekin Water Boards	Qld	Water legislation entity: Category 2 Water authority under <i>Water Act 2000</i> (Ch 4)	Executive has 7 directors: 4 elected by growers, 2 represent mills, 1 from local government (changing with joint venture)
5. Winnaleah Irrigation Scheme Ltd	Tas	Company limited by guarantee	A board of 6 elected by and from the members.
6. West Corrgan Private Irrigation Board	NSW	Water legislation entity: Private Irrigation Board under <i>Water Management Act 2000</i>	Landowners elect board of 10, 2 per zone.
7. First Mildura Irrigation Trust (FMIT)	Vic	Water legislation entity: A water authority under the <i>Water Act 1989</i> (now subsumed by Lower Murray Water),	Board of 6 elected by holders of irrigation properties within the irrigation district.

### IMPLICATIONS FOR WESTERN AUSTRALIA

For co-management of groundwater areas or unregulated rivers, either a non-profit cooperative, a company limited by guarantee or an incorporated association provides adequate options to create governance arrangements which have substantial flexibility, are robust and are tailored to local circumstances. Each:

- is a separate legal entity capable of owning property, employing people etc;
- continues regardless of membership changes;
- provides financial protection to members by limiting personal liability to outstanding fees;
- allows flexibility in establishing governance arrangements in a constitution where typically members rather than shareholders have voting rights; and
- is designed to be non-profit, and therefore attract related taxation concessions.

If the entity is likely to handle substantial funds or own assets of significant value then the more rigorously scrutinised cooperative or company limited by guarantee would be preferred. Cooperatives in principle are more focused on the mutual benefit of members, and obligate members to be active and participate.

Profit making companies and cooperatives could be used, though none of the case studies did so. There seemed to be no need to allow profits to be distributed to shareholders or members. Rather the ‘profits’, if any, are sunk back into improved service delivery or reducing fees to members, and the tax concessions associated with being non-profit are an additional benefit. Prior to making any decision about governance arrangements, the proposed entity should seek legal and financial (tax implications) advice.

## **BOUNDARIES**

### **GENERAL EXPLANATION**

One of Ostrom's principles is that boundaries of self-governing institutions should be clearly defined in terms of the territory and the people to whom the access rights apply. To be effective, defined areas should be logical for management purposes and all those who need to be included should be.

### **COMPARATIVE ANALYSIS**

All of the case studies had clearly defined boundaries in which they operated.

CIT, FMIT, Winnaleah, Abercombie and West Corurgan all operated within statutory districts, in which the entity had the ability to exercise statutory powers. These districts were defined around water supply systems which take water from headworks, and distribute to land. They have little to do with management of the water resource from which they take water.

Bega Valley Water Users Association operates within a catchment, which recognises its role in water sharing for self supply water users from a river system. The Burdekin Boards have irrigation districts which are defined by the aquifer which is used for self supply by landholders within the district and actively replenished by the Board.

In the Burdekin the two Boards have recently decided it would be more efficient and effective to operate as a joint venture. Another entity, Sunwater, manages water taken directly from the river by riparian irrigators in the Board area. Stakeholders report that having three separate entities has prevented effective management of the resource. In particular there are concerns about the effect on the Boards' ability to management the aquifer within safe limits, particularly once trading is introduced. This concern should be mitigated if the Water Resource Plan and Resource Operation Plan<sup>2</sup> are developed in collaboration with users so that both resource and stakeholder needs are addressed.

While not a case study, as part of the water planning process, the Lockyer Water Users Forum proposed that all of the Lockyer should be managed under a co-management arrangement to ensure equitable arrangements across the area, whereas the Queensland Department of Natural Resources and Water (NRW) indicated that the central regulated area would be managed under separate rules. According to Ostrom, this is not ideal to achieve sustainable management. It increases complexity of system management and needs to carefully manage equity issues. However, like the Burdekin, these issues could be mitigated if equitable and appropriate rules are developed in collaboration with the users.

### **IMPLICATIONS FOR WESTERN AUSTRALIA**

Co-management in WA is proposed as an option to manage distributed self supply access to a common water source, rather than a shared water distribution system. To ensure effective resource management, any entities should be related to the resource boundaries to the largest extent possible and include all irrigators within those

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<sup>2</sup> Which provide 'the rules' for managing the water resource under Queensland legislation

boundaries. To do otherwise, while not impossible, would lead to unnecessary complications in management to ensure cross-boundary impacts are managed, and the likelihood of perceived inequities where different rules apply to people drawing from the same resource.

Boundaries of entities must be precisely defined. It must be absolutely clear who is in and who is out, otherwise there are likely to be disputes at the edges as to which rules apply to individuals. Of most importance is that those affected by management rules are involved in the development and implementation of rules.

## **KNOWLEDGE OF RESOURCE**

### **GENERAL EXPLANATION**

Where there is to be co-management of a water resource, both the managing entity and the users must be empowered with the knowledge needed to understand potential impact on environmental assets, other water users and the integrity of the resource itself. Constraints must be established so that these potential impacts are managed both individually and cumulatively.

It is common for groups of water users to agree to provide mutually fair access during times of low water availability, but is less common for them to take into account longer term or more distant impacts of their combined take. Water planning by government provides for the longer term sustainability of the resource to meet both human and environmental requirements. Under the NWI, water planning is intended to use best available information to establish water sharing arrangements which provide for water use at a level of risk to environmental and other public benefit outcomes which is agreed to be acceptable. Water planning ensures that broad limits on rates and timing of extraction are established to meet these outcomes, and that rules are linked to real time monitoring.

Ostrom suggests that users should be involved in deciding what data is needed, and either do the monitoring or receive monitoring information as soon as possible. Introduction of telemetry systems make it possible for users to receive usage data quickly as well as river/aquifer levels, quality and weather data, depending on the system. Where telemetry is not cost-effective, it is essential that users be engaged in monitoring their own use for crop management and water efficiency purposes, to ensure they are using within allocation, and as data for discussions or negotiation about allocation.

### **COMPARATIVE ANALYSIS**

All of the case study entities recognised the importance of water planning and either had been or are about to be involved in planning processes. In the case of the Bega Valley Water Users Association, the Association worked with other stakeholders and government agencies to develop a water plan. In developing the plan a range of studies into environmental needs and social and economic impacts were commissioned. The Association recognised that both monitoring of the resource and the water being taken from it were essential, and actively supported introduction of metering.

CIT, FMIT, Winnaleah, Abercombie and West Corurrgan all install, manage and read meters at headworks and on each supply point within their systems. In the case of Bega each individual pays for and maintains his own meter. While they are obligated

have meters by the Department, they have voluntarily determined to upgrade their meters to include telemetry. CIT, Burdekin and West Corugan have received or applied for funding to install remote meter reading or develop irrigation modernisation plans for their districts which include enhanced metering through a program offered by Commonwealth government.

CIT, Burdekin, and West Corugan explicitly take a role in resource monitoring issues that affect users in the long term – eg aquifer levels, salinity, and water quality. Burdekin and West Corugan specifically mentioned the supportive role of other bodies or funding sources to provide information such as CSIRO, NHT, NRM regional bodies.

**Table 3: Information role**

Case study	Information role	Data from Meters
1. Central Irrigation Trust (CIT)	CIT provides web-based reports on salinity, rainfall and weather, automated usage data	CIT owns and monitors meters; encourages users to monitor use
2. Abercrombie Pumping Association	Monitors usage	The Association maintains meters at the offtake and at each supplied property.
3. Bega Valley Water Users Association	Both resource status and water usage information is collection and managed by the Dept.  Operational information on river levels is basis for rostering arrangements facilitated by the Association.	Dept monitors time and event electricity meters funded by water users. Dept organising telemetered water meters linked to web site.
4. North and South Burdekin Water Boards	Dept monitors level of aquifer and water quality on monthly basis. The Board, CSIRO and Burdekin Dry Tropics NRM Board sponsor research and monitoring on groundwater, salt-freshwater interface, water quality and salinity in aquifers	Board owns and operates meters for 'open water' extraction. Charges once-off fee to cover cost of meter and installation. No meters on bores but will be required on all bores once ROP in effect
5. Winnaleah Irrigation Scheme Ltd	Monitors usage	Maintains and is upgrading meters at properties; installing remote monitoring of meters
6. West Corugan Private Irrigation Board	Using NHT and Living Murray funds, a Land and Water Management Plan was prepared but not implemented; Board plays role in understanding seepage and losses; only monitors water quality when a threat	The Board maintains meters at the offtake and at each supplied property.
7. First Mildura Irrigation Trust (FMIT)	Monitors usage	The Trust maintains meters at the offtake and at each supplied property.

## **IMPLICATIONS FOR WESTERN AUSTRALIA**

Most irrigators agree that management decisions need to be based on the best information available. Understanding the water balance in an area to determine sustainable use requires knowledge of inputs and outputs via extraction. All jurisdictions have reported difficulties in developing water allocation plans due to lack of information, particularly groundwater data and effect of extraction scenarios on ecosystem health. Where metering has not been required to date, it is being introduced.

Planning requires long term information, but operational water sharing requires current information often on a real time basis so that management can be responsive to resource changes as they occur. For example Bega Water Users have advocated and been willing to fund movement to more sophisticated remote monitoring meters so that river levels and water extraction information can be accessed by the water users through a web site. Under this scheme not only will water users be able to actively manage their own extraction, but they can monitor each other for compliance.

CIT likewise makes a range of real time information available to its members so they can actively self manage.

In summary the information needs for self management are:

- a water plan which has assessed risks and set rules for ‘sustainable’ annual bulk extraction rates and day to day extraction constraints linked to resource monitoring (river or aquifers levels, water quality)
- ongoing scientific assessments and monitoring of outcomes linked to plan review processes
- day to day information on the resource (related to defined triggers) and on water extraction, made available to the water users.

The first two areas are more appropriately the responsibility of government agencies responsible for water planning. The third area could well be delegated to a self management entity.

## **ROLES AND RESPONSIBILITIES**

### **GENERAL EXPLANATION**

This section refers simply to the various roles and responsibilities undertaken by entities. The ability to influence decisions of the entity is discussed under the next theme.

According to Ostrom et al (2005) it is helpful if self-governing bodies are nested within regimes that can provide a framework and support. WA policy recommends that a self-government entity would need to be subject to a statutory regional or sub-regional water plan, such as in all other jurisdictions.

### **COMPARATIVE ANALYSIS**

Water legislation entities such as CIT and the Burdekin Boards have roles and responsibilities defined by the Act and associated statutory powers. Subject to the legislation allowing it, statutory powers can also be given to private entities. For example, NSW irrigation corporations are private entities which are registered and

regulated under the Corporations Act just like any other private company, yet they have statutory powers set out in legislation, administered through an operating licence.

The Tasmanian approach is even more flexible, with the Minister delegating such powers as he/she sees fit, subject to whatever conditions (eg reporting) provided it contributes to the objects of the Act. Thus Winnaleah is a private company to which powers are delegated by an instrument of delegation subject to obligations being met.

West Corugan and FMIT constructed irrigation infrastructure such as headworks, channel and piping systems for surface water distribution. In the case of CIT, the South Australian government developed the irrigation scheme and upgraded channels to pipes before handing it over to CIT once certain governance conditions were met. Except for Bega, all of the entities manage and maintain irrigation systems. The Burdekin is the only entity that manages groundwater to ensure sufficient recharge to prevent saltwater intrusion in the coastal aquifer, while CIT manages drainage to prevent salinisation from rising groundwater.

Besides roles in managing irrigation schemes, the CIT and Burdekin facilitate training and provide additional services such as bulk purchasing of equipment or equipment rental. CIT also indicated that it played a strong role in helping the organisation adjust to water reforms and lobbied on its behalf.

**Table 4: Roles and Responsibilities of Case Study Entities**

Case Study	State	Roles and Responsibilities	Statutory Powers
1. Central Irrigation Trust (CIT)	SA	Construct and maintain irrigation infrastructure; control water flow in irrigation system; purchase irrigation equipment; remove soil; acquire land; manage trading; owns, installs, and monitors meters; advocates on behalf of growers; organises training in irrigation efficiency	Powers of entry to construct and maintain works and read meters. Power to levy fees for supply of water. Various other powers. Trust may make regulations subject to Ministerial approval.
2. Abercrombie Pumping Association	NSW	Maintain and operate channel system to deliver water to the properties of members. Owns and maintains meters.	None
3. Bega Valley Water Users Association	NSW	Facilitate sharing of water during periods of water shortage.  Advocate on behalf of its members in government and industry forums.  Develop enhanced water supply options for its members.	None
4. North and South Burdekin Water Boards	Qld	Water distribution and aquifer management; can undertake environmental responsibilities to address erosion control, riverine protection, land degradation  Owns and maintains meters  Hires out equipment	Powers of entry to construct and maintain works and read meters. Power to levy fees for supply of water. Various other powers.

5. Winnaleah Irrigation Scheme Ltd	Tas	Maintain and operate pipe system to supply water to landholders and 2 towns within the District. Owns and maintains meters.	Powers of entry to construct and maintain works and read meters. Power to levy fees for supply of water.
6. West Corugan Private Irrigation Board	NSW	Constructing and operating water supply works (distribution from own headwork);	Powers of entry to construct and maintain works and read meters. Power to levy fees for supply of water. Can make by-laws
7. First Mildura Irrigation Trust (FMIT)	Vic	Constructing and operating water supply works (distribution from own headwork)	Powers of entry to construct and maintain works and read meters. Power to levy fees for supply of water.

**Table 5: Water entitlement arrangements**

Case Study	State	Entitlement arrangements	Role in water trading
1. Central Irrigation Trust (CIT)	SA	CIT holds bulk licence for each district; and determines allocations within the district. Individuals have defined allocations within the bulk entitlement.	CIT manages and approves trading within and outside of district; in 2006-7 CIT facilitated trading for 511 irrigators
2. Abercrombie Pumping Association	NSW	Bulk water access licences held by the members as tenants in common with prescribed shares designated on the licences. The Association distributes available water in proportion to these defined shares.	Informal temporary trading between members so far. Permanent trading of entitlement externally requires approval of a majority of members as water licence has to be modified.
3. Bega Valley Water Users Association	NSW	Members hold water access licences as individuals.	None
4. North and South Burdekin Water Boards	Qld	Board holds bulk entitlement to river extraction and distributes to users or for recharge as required. Recently established that Sunwater will allocate additional water to riparian licensees external to Board control.	Will be allowed once next phase of water planning completed.
5. Winnaleah Irrigation Scheme Ltd	Tas	Holds bulk water licence. Irrigators within the District have volumetric water rights, which WIS is obligated to supply (subject to water availability).  Also has an obligation to supply water to two small towns and 200 domestic users.	The Department approves trading of allocation within the District. Currently no trading in or out of the District.
6. West Corugan Private Irrigation Board	NSW	Holds bulk water access licences. Irrigators within the District have volumetric allocations which the Board is obligated to supply (subject to water availability).  Also has an obligation to supply stock and domestic water to properties within the District.	Board facilitates and approves temporary and permanent trading of allocation within District. Trading outside the District is not allowed (although Federal government legislation is likely to force the Board to permit it).

7. First Mildura Irrigation Trust (FMIT)	Vic	Trust holds bulk entitlement and individuals have water shares within the bulk entitlement.	Approves water trading, subject to government trading rules.
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CIT, Burdekin, WIS, and West Corugan and FMIT hold bulk water entitlements and distribute water proportionally according to individual entitlements within each scheme. In the case of Abercrombie, entitlement is held jointly by members with each member's proportion identified on the licence. In Bega water entitlements are held solely by individual self supply irrigators.

Each of the entities managing water supply infrastructure has a role in approving water trading, where it is feasible. They generally encourage temporary trading within the district (ie between users of the common infrastructure), but are less supportive of trading from within to outside because of the implications this has for the ongoing viability of the water supply infrastructure.

### IMPLICATIONS FOR WESTERN AUSTRALIA

For self management of water resources, it is not necessary to establish in legislation the ability to create entities such as water trusts or authorities. While it may be appropriate to delegate ministerial powers to a self management entity, there is no practical reason that this cannot be done to private entities as for Winnaleah in Tasmania. The legislation would need to allow this to occur; at the moment this is not proposed for the new WA water legislation. Legal advice should be sought on whether existing statutory delegation powers are adequate and practical. For example it should be possible for the entity to sub-delegate to employees, and the ability to tie such delegation to oversight and the keeping of commitments via an operating licence or agreement.

A decision needs to be made about which powers are delegated. This will depend on the agreed functions the entity will undertake. Certain powers are essential; if an entity takes an active role in monitoring, it needs powers to enter land, read and repair meters and instruments.

There also needs to be an ability to withdraw devolution of powers, having identified legitimate grounds for withdrawal, whether temporary (eg while an administrator is in place), and whether it would be appealable. Consideration also needs to be given to what would happen if powers were withdrawn or an entity becomes non-functional eg what happens to assets? How are the rights of individuals preserved? Who would assume the responsibilities?

A possible model is to create an 'operating licence' in legislation which allows the Department to set out the functions delegated to an entity and the obligations that accompany those functions. For example NSW legislation provides for statutory powers to be exercised by irrigation corporations (which are not water legislation entities, – they are companies or cooperatives) subject to the details being set out in an operating licence.

WA policy, similar to all other jurisdictions, is that entities would operate within a framework of a statutory water management plan. Governments tend to involve irrigation entities in water allocation planning processes, which requires an understanding of and commitment to maintain or restore environmental flows if possible.

While few of the entities had explicit roles regarding environmental stewardship, certainly it is essential for long-term sustainable use of the resource. NSW irrigation corporations have an obligation to implement district wide land and water management plans which have stewardship implications. At minimum all entities should be obligated to monitor and report usage. In groundwater areas and areas with salinity issues or potential for salinity, irrigators through their entity should be involved in monitoring aquifer levels and managing salinity with government support where necessary.

It is also important that the rights and obligations of both the entity and its members are clearly set out. Water rights are a particular point here – it is important for individuals to have clear water entitlements and the entity to have powers to restrict them according to clear rules when necessary.

## **LEGITIMACY (RECOGNITION, DECISION-MAKING, ACCOUNTABILITY, AND CONFLICT RESOLUTION)**

### **GENERAL EXPLANATION**

Recognition of the legitimacy of the entity by governments, water users and other resource management bodies is essential to being a self-sustaining body (Ostrom's principle 7). Legitimacy is enhanced by being a legally recognised body (eg incorporated), and/or having certain powers, either delegated by government or legitimised by members. Inclusive decision making processes and accountability mechanisms contribute to the reputation of the body, from both user and government perspective. In regimes studied by Ostrom, establishment of rules under which the system operates was limited to those people affected by the changes so that they reflected local conditions and circumstances and ensured continual investment and compliance. Methods of conflict resolution need to be graduated so that small conflicts can be resolved at a local level, with an independent third party being used to resolve conflicts involving more complex or serious issues.

Assurance of effective management is also important to other bodies that could be supportive for collaboration on research or management such as universities, CSIRO and Regional NRM bodies. WA policy requires that a self-managed organisation must be accountable for its regulatory performance.

### **COMPARATIVE ANALYSIS**

In all cases examined, a Board of directors or executive is democratically elected by the members usually on a term basis. This ensures member commitment and provides members with an ability to change leadership if dissatisfied. In the case of the Burdekin, a representative from local government and two from sugar mills are also on the executive because of the water demands from these institutions.

In most cases, the statutory arrangements or constitutions set out how major decisions should be made as well as accountability mechanisms. While the executive or staff is usually empowered to make operational decisions affecting day to day running of the organisation, most entities indicated that all members were involved in major decisions. If small in number, members were canvassed by phone or a special meeting was called; for large organisations, major decisions were often dealt with at the AGM. Organisations such as CIT and WCPID had regular newsletters to communicate with members. Entities indicated that conflicts were resolved internally. An example was

given of a member who wanted to permanently trade out of the Abercrombie system and while members disagreed, they realised that it could not be easily prevented and resolved to allow it with some compensation to the entity.

Accountability mechanisms, such as reporting, for the most part were scaled according to the level of financial responsibility and delegated powers. FMIT indicated that a review was needed of its currently time-consuming monthly reporting requirements.

## **IMPLICATIONS FOR WESTERN AUSTRALIA**

It is important that a self-governing irrigation entity be formalised legally, but not necessarily in water legislation. Formal constitution of decision-making processes and accountability mechanisms all contribute to an organisation's legitimacy.

A recent review of water planning around Australia (Hamstead et al 2008) found that processes for water allocation planning undertaken by government are consultative with stakeholder advisory committees being a main method of participation. Irrigation entities are always represented on these committees in various numbers, some arguing that irrigators should be in a majority since they are most affected by outcomes of water planning. The review found that there is a need for greater involvement of all stakeholders in identifying and analysing options and recommending trade-offs. It found that in some cases irrigators and their organisations significantly influenced outcomes. While Ostrom suggests that members should form the rules (collective choice arrangements), this may be most appropriate for rules about day to day operation to ensure flexibility. Irrigators' needs should be taken into account in water plans, but so do those of other users and the environment. By participating in the process, irrigators can input to decision-making, gain understanding of the trade-offs and a greater commitment to the outcomes.

Decision-making processes need to be mindful of risks and contingencies. Processes should be established to address them eg clear and frequent communication; clarity about roles and responsibilities; transparency about financial matters, and mechanisms to minimise conflict.

Accountability and reporting mechanisms need to be tailored to the complexity and financial and legal obligations of the entity so they are sufficient to assure probity but not too onerous to impact on operation.

## **COMPLIANCE**

### **GENERAL EXPLANATION**

Inevitably there are infringements of rules. There must be an ability to enforce compliance on recalcitrant members – whether it be for taking too much water or not paying fees. Successful co-management systems have a graduated system of sanctions (Ostrom principle 5) with minor sanctions such as a warning for a first or minor offence and greater penalties for more serious offences.

### **COMPARATIVE ANALYSIS**

All but one case study entity manages its own enforcement: Bega relies on government to manage enforcement. Fees for use in excess of allocation range from \$46 to \$2000/ML, reflecting the level of seriousness of overuse for each area.

Generally though the entities managed compliance effectively without resorting to drastic measures. Irrigators appreciated that what they were doing could impact their neighbours and difficulties where they arose were resolved by negotiation. This was particularly so for smaller entities eg Abercrombie.

**Table 6: Compliance and Penalties of Case Study Bodies**

Case Study	State	Enforcement	Penalties
1. Central Irrigation Trust (CIT)	SA	Can impose penalties	Determined by government eg \$1000/ML for overuse of allocation
2. Abercrombie Pumping Association	NSW	Cut off supply.	Nil
3. Bega Valley Water Users Association	NSW	Nil. Relies on the Department to manage enforcement	Nil
4. North and South Burdekin Water Boards	Qld	Can impose penalties	Overuse is charged at \$48.09/ML
5. Winnaleah Irrigation Scheme Ltd	Tas	Can cut off supply to irrigators. Otherwise relies on standard debt recovery for non-payment of fees.	Nil
6. West Corugan Private Irrigation Board	NSW	Can impose penalties, and cut off supply	Penalty fees can be levied by the PID due to overuse, pollution or interfering with infrastructure.
7. First Mildura Irrigation Trust (FMIT)	Vic	Customer code of conduct outlines customer' rights and responsibilities and includes complaints resolution process. Cooperative approach to debt collection.	Excess water penalty \$2000/ML

## IMPLICATIONS FOR WESTERN AUSTRALIA

Pushing compliance to the local level has potential to both improve compliance and reduce the cost of doing so. Where irrigators consider themselves part of a mutually beneficial arrangement with sharing rules they considered to be fair, non-compliance is less of an issue. Where problems arise, the case studies showed that they were generally able to be dealt with in smaller organisations by a combination of negotiation and peer pressure.

Behind this though, it is clear that the ability to enforce rules is still essential. There will be greater commitment to rules if users are involved in formulating them and they make sense for the location and crop types. Peer group pressure and discussion within the group are effective as the first step in graduated sanctions. It is important that the entity have a clear statement of policy and process for breaches of rules which members understand and accept as being fair and equitable. Winnaleah in Tasmania for example, report that they have never had any problems that they have not been

able to resolve by good communication, and by reminding users of the mutual benefits of the scheme which rely on cooperation and payment of fees.

However to make any such scheme work there has to be the ability to impose penalties including preventing access to water should all else fail. Provisions for the agent of the entity to enter land and having properly maintained meters connected to the pump are essential for any self management entity. Ability to impose financial penalties is also desirable.

With surface water delivery systems compliance is generally enforced after other measures fail, through cutting off supply. However this is not a feasible approach for self supply irrigators. As a last resort governments enforce in such cases through the ability to enter and impair or remove pumps, and through prosecution. Such approaches would be difficult for a small community based entity to implement, which is why Bega Water Users Assn has preferred government to retain this role.

A possible approach would be for self management entities to have the ability to suspend a person's entitlement to take water, and report taking of water in such cases to a government agency for enforcement using general statutory powers for illegal extraction.

## **ORGANISATIONAL RESOURCES**

### **GENERAL EXPLANATION**

Ostrom's second principle is about proportional assignment of costs and benefits to ensure longevity of the organisation. A commitment to investing in the entity in terms of time, effort and financial resources must be matched by the benefits the user perceives he is getting i.e. cost-effectiveness.

This refers to contributing to the cost of human resources ie employing people to run the organization, capital costs for constructing and maintaining infrastructure and operational costs for delivery of water and monitoring of extraction and the resource. The services provided – delivering or sharing water, advice, advocacy – need to be cost-effective. There needs to be sufficient cost recovery to maintain the organisation. The NWI has also required that the cost of water provision be borne by the users. However members complain if they pay but do not receive essential services; in the recent drought across Australia, members are concerned about maintaining organisations when there is little water to be delivered.

Consideration also needs to be given to who holds the physical assets and what happens to them if the entity implodes.

### **COMPARATIVE ANALYSIS**

In all cases, entities strive for cost recovery of essential services through levies on their members. Capital intensive schemes require higher levies for maintenance and operation. In most cases, members vote on the annual budget and fee structure. Budgets and employment vary considerably across the case studies. Small entities with limited roles and responsibilities like Bega can manage with no staff and a budget of \$3300. Volunteers can manage it if they only provide advice or coordination but greater administrative and/or operational roles require at least part-time staff, such as for WIS where one person undertakes routine

operations/maintenance and part-time secretarial/accounting support is contracted, with a budget of \$250,000. This compares to 31 staff and a budget of \$8.2m for CIT.

**Table 7: Resources of Case Study Bodies**

Case Study	State	Fees and charges	Income	Expenses
1. Central Irrigation Trust (CIT)	SA	Revenue from consumption-based water sales (64-70%); domestic sales (11%), investment interest (7%), industrial sales and catchment levy (5% each), grants (3%)	\$8.2M (\$2.3M Water Smart grant for telemetry)	31 staff
2. Abercrombie Pumping Association	NSW	Members are levied fees sufficient to cover costs. Stock and domestic supply is charged per acre and irrigation is charged per unit of entitlement.	Typically \$300k - \$400k	Employment of a full time water bailiff and a part time secretary and accountant.  Remuneration to committee chair \$10k/yr.  Vehicle, tools, parts etc  State charges for water (\$100k - \$300k per year)  Capital replacement sinking fund.
3. Bega Valley Water Users Association	NSW	Members are levied a fee of \$50 per year. Special subscriptions raise funds when needed for particular projects.  Irrigators are separately levied annual water use charges by the Department.	\$3300	Exec travel, administrative support, public liability insurance
4. North and South Burdekin Water Boards	Qld	Levies rates and charges on customers – levies based on assessable crop area (ie per ha) (77% of income) + volumetric irrigation charges (ie per ML)	\$3.4M – North Burdekin Board	11 and 7 staff in North and South Boards respectively with roles in management, channel and pump maintenance.
5. Winnaleah Irrigation Scheme Ltd	Tas	Charges to irrigators of \$47/ML delivered. Domestic only customers have a flat fee of \$110/year.	\$250k	Employment of a full time overseer and a part time secretary and accountant.  Vehicle, tools, parts etc  Capital replacement

Case Study	State	Fees and charges	Income	Expenses
				sinking fund.
6. West Corugan Private Irrigation Board	NSW	Levies rates on members: fixed fees and consumption charges	\$2.3M	7 staff - 28% of budget is spent on labour, 24% on water, 32% on operation and maintenance of plant and channels, and 6% on administration.
7. First Mildura Irrigation Trust (FMIT)	Vic	Projects funded by FMIT and its customers. Recovers costs from irrigators through 11 different charges eg customer charge \$167; bulk water charge of \$6.17/ML; metered use charge \$42.55/ML.		27 staff

## IMPLICATIONS FOR WESTERN AUSTRALIA

It is evident that self management requires the deployment of staff. This could be part time or full time, as an employee or a contractor, depending on the extent of activity needed. Even for the case of management of self supply water users, at a minimum a person (part time or full time) is needed to read meters, maintain monitoring equipment and prepare reports.

It is important for fairness that this person is seen to be independent, reporting to the entity as a whole. Ostrom et al (2005) describe such persons as 'monitors' and note that they are essential for self management to function.

In addition it is clear that general administrative support is also needed, though for the small entities this was done through an hourly rate contract with an accountancy firm. Whether fees are paid to the executive depends on the level of time involved and the commitment to voluntarism, but certainly expenses incurred (eg travel) would need to be met.

Other costs would include insurance, meters, resource monitoring (eg monitoring bores, data handling and processing). If the entity is responsible for meters, then this cost would also be a recoverable. New national standards for metering require meters to be installed and maintained and periodically certified. There are a range of options here. The meters could be owned and maintained by the government, the entity or individuals. One way or another the irrigators would have to fund the costs.

Consideration could be given to entities sharing support where they are located within a reasonable geographical distance from each other.

# SUMMARY AND CONCLUSIONS

## DRIVERS

### National Water Initiative

Commencing with COAG water reforms in 1994 and reinforced by the National Water Initiative (NWI) (CoA 2004), jurisdictions around Australia, water user entities, and irrigators have been challenged to address:

- water planning to address water security and for public benefit including the environment;
- managing risk through information and continuous improvement;
- community engagement to ensure commitment; and
- additional reporting and accountability requirements.

A number of the entities played a role in implementing aspects of the NWI: participating in water planning, managing trading, and monitoring. Importantly they acted on behalf of members in negotiations on reforms and can facilitate collaboration on development of allocation sharing rules. The increased irrigator responsibilities for sustainable water management under the NWI mean that community-based water resource management is appealing. It can provide support to irrigators and a unified entity for government to deal with.

### Irrigation Enterprises

In discussions with case study interviewees, the following issues were raised as drivers for taking community-based management, some of which are based on perceived threats due to water reforms:

- Concern about implications of reform
- Not wanting government 'interference'
- Values about self-sufficiency, self-determination, managing own destiny
- Concerns about additional costs due to water pricing and costs of metering
- Need for flexible management of enterprise to respond to business and crop needs
- Need for information to manage resource
- Efficiencies through collaboration with those with common interests and needs
- Combined search for alternative or additional water supplies.

## BENEFITS

A number of benefits of community-based management were identified from literature and in the course of interviews and case study analysis. From the government's perspective, advantages are:

- With irrigators taking responsibility under agreed rules, there are less operational demands on government.
- Monitoring of compliance by government ensures the system is working, yet there should be less non-compliance if the entity is involved in developing the rules

- Irrigators should understand and be able to respond quickly to water management issues rather than waiting for a periodic or infrequent review of resource status. This is better for long-term sustainability.
- Irrigators are willing to pay for activities over which they have control and where they can see the purpose and benefit.
- Economic benefits are greater overall because operations can be cost-effective and adaptable, and irrigators will commit greater energy and innovative thinking to tuning and improving things.

From the irrigators' perspective, advantages are:

- Day to day responsibility for water management is in the hands of irrigators who can maintain operational flexibility and implement innovative flexible solutions to meet irrigation needs.
- Irrigators are more able to respond quickly to issues and adaptively manage the resource if they are involved in monitoring.
- When users are involved in developing the rules and monitoring compliance (as a first check), non-compliance is reduced. However an ability to refer compliance issues to government alleviates irrigators' concerns about potential destabilisation of community well-being. This should require fewer resources and therefore be more cost effective overall for compliance.
- Influencing the rules and overseeing operational arrangements is empowering for irrigators.
- Such an entity can provide cost-effective provision of services for irrigators eg joint purchase of water efficient devices and/or consulting advice.
- Irrigators are more willing to pay costs because they can see exactly what the funds are going to and the immediate benefit they receive.

## BARRIERS AND RISKS

A number of barriers to community-based management were identified. These usually indicate perceived risks. For every barrier and risk, there are also responses or contingency options that can reduce the risk.

**Table 8: Barriers, Risks and Possible Responses**

Barrier	Perceived Risk	Response/Contingency
Government resistance to devolving responsibility	Entity may not be considered legitimate because of lack of irrigator support or capability	Entity to employ skilled person(s) as coordinator or operations. Initial establishment must have high level of support from irrigators.
Government resistance to devolving responsibility	Serious lack of meeting obligations. Failure of entity	Supportive framework that includes agreements between entity and gov't which identify roles and

	<p>management in terms of assets and finances.</p> <p>Perception that gov't can do better</p>	<p>responsibilities for monitoring and compliance.</p> <p>Develop water plans collaboratively to ensure common understanding of environmental requirements and irrigator needs.</p> <p>Contingency agreement between entity and government. Fall back to government control and asset ownership should the entity fail.</p>
Credibility of organisation: acceptance by irrigators of the entity	Lack of trust and collaboration	Seek professional advice on governance and organisational operating rules. Select type of entity appropriate to risk. Employ skilled coordinator.
Size of entity (membership)	Financially unviable – members unable to support part-time staff or entity beaks up.	<p>Roles and responsibilities should be tailored to the capacity of the entity.</p> <p>Contingency agreement between entity and government. Fall back to government control and asset ownership should the entity fail.</p>
Cost effectiveness of co-management	Benefits not worth the expense.	<p>Reconsider benefits eg cost-effective purchase of water efficiency equipment; eligibility for grants or other assistance.</p> <p>Entity to collaborate with government in developing rules, with individual responsibility for implementation.</p>
Complexity of business that now includes metering, trading, possibly pricing requiring additional skills and knowledge	<p>Developing irrigator capacity.</p> <p>Employing appropriately skilled people</p>	<p>Government to take responsibility to ensure collaborative water planning processes that are transparent and inclusive, to build understanding and commitment.</p> <p>Government support in initial training and establishing operating protocols.</p>
Difficulties with enforcement in self supply	<p>Non-enforcement of non-compliance.</p> <p>Community unrest.</p>	Nested framework with government having ultimate responsibility for enforcement.
Not meeting environmental sustainability objectives	Irrigators give priority to short term economic benefits over long term environmental	Develop water plans collaboratively to ensure common understanding of environmental requirements and irrigator needs. Encourage understanding of the value of

	sustainability.	environmental assets and the risks. Requirements for monitoring and reporting by the entity.
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## CONCLUSIONS

There is strong evidence globally and within Australia that community-based management of water is feasible and has many benefits. However self management of extraction by a group of self-supply irrigators has not been done anywhere else in Australia. If WA government chooses to support community-based management it will be extending the principles and approaches used elsewhere into new territory. It will need to build in contingency plans for key features of the process.

Success factors of the case study entities are:

- they have a clear purpose which the entity members understand and recognise as being mutually beneficial
- they have committed leadership and a high level of irrigator support
- they have stable, participatory, governance arrangements
- the members are willing to pay for the services the entity provides.

While some of the entities were able to promote water use efficiency through training and grants for improved infrastructure, there were also concerns that some entities protected their members' current extraction levels in lieu of seeking sustainable resource management. From government's perspective this is a serious issue as government is accountable to protect environmental assets and provide other public benefits, a requirement under the NWI. Funding from Commonwealth to State governments resides on meeting these obligations. Government will not delegate responsibilities unless it is clear that these commitments can be met. Collaboratively developed water plans will contribute to joint commitment.

Governance and financial accountability needs to be transparent and to meet obligations and responsibilities – this is a fundamental requirement, not optional. Another challenge relates to irrigators not wanting to pay for membership unless it is going to guarantee water. Without an income from irrigators, the entities would not survive. Ensuring water is difficult given climate change but has a greater chance of success if water plans are based on sound data, are precautionary and adaptive in approach.

## RECOMMENDATIONS

It is clear that the arrangements need to be tailored to the situation, – the size of the area and membership and interest and capacity to support it. To ensure that government obligations to provide for environmental and other public benefits and resource security under the NWI are met, water plans must be developed for each area. For water plans to be successful, they need to be developed collaboratively with the entity and its members. Such entities should be self-sustaining financially but be supported with legislation, guidelines and agreements as required to give legitimacy and strengthen mutual commitments. Incentives may be needed to support transitioning to new arrangements.

If the WA government decides to support community-based governance of self-supply of water for irrigation, the following preferred arrangements are proposed (Table 9). These would meet the requirements of Ostrom et al (2005) for successful self-governance in a 'nested framework', as well as the minimum requirements specified by the WA government. Each of the themes analysed in this study is addressed under major headings, for succinctness.

**Table 9: Recommended community-based governance arrangements**

Theme	Requirements
<b>Governance</b>	
Preferred type of entity	<ul style="list-style-type: none"> <li>• non-profit cooperative, or incorporated association, depending on financial accountability needed</li> </ul>
Membership and boundaries	<ul style="list-style-type: none"> <li>• must include all self supply users within the resource area and encompass the whole resource</li> </ul>
Constitution	<ul style="list-style-type: none"> <li>• non-profit, sets out purposes, eg manage resource extraction within sustainable yield; advocacy; support irrigators through reform</li> <li>• based on international principles for cooperatives</li> <li>• specifies accountability mechanisms</li> <li>• Board of 3-6 elected by all members (depending on size of entity)</li> <li>• members participate in all major decisions such as allocation rules, setting fees, and annual budget</li> <li>• includes conflict resolution mechanisms</li> </ul>
<b>Roles and responsibilities</b>	
Water planning - making the 'rules'	<ul style="list-style-type: none"> <li>• involvement of members collaboratively in development of water management plan</li> <li>• development and implementation of locally tuned operational water sharing rules which implement 'bulk' rules set out in water plans</li> </ul>
Water entitlement arrangements	<ul style="list-style-type: none"> <li>• clear individual entitlements which specify share of available water and obligations in relation to timing and rate of extraction</li> </ul>
Water trading	<ul style="list-style-type: none"> <li>• approve movement of entitlements, consistent with rules set out in water plans</li> </ul>
Knowledge and protection of the resource	<ul style="list-style-type: none"> <li>• metering, monitoring and reporting on resource condition and use; adaption of usage in response to triggers and shared knowledge</li> <li>• collaborative monitoring of water dependent</li> </ul>

	<p>environmental assets (wetlands etc)</p> <ul style="list-style-type: none"> <li>• development of water use efficient irrigation and additional or alternative water supply options for the benefit of members</li> <li>• education and active participation of members in development of rules and policies, in responsible water sharing and in resource stewardship</li> <li>• collaboration with government and NRM regional or catchment bodies</li> </ul>
Delegation of statutory powers	<ul style="list-style-type: none"> <li>• ability to enter land to construct works to monitor the resource, install meters, read meters and monitoring equipment</li> <li>• ability to declare restrictions on water availability under entitlements as needed to comply with rules set out in water plan</li> <li>• ability to create local water sharing rules (eg rostering arrangements) which are enforceable</li> <li>• ability to impose fees on entitlement holders</li> <li>• ability to impose financial penalties for non-compliance (within limits)</li> <li>• ability to suspend entitlements for non-compliance or non-payment of fees</li> </ul>
Compliance and enforcement	<ul style="list-style-type: none"> <li>• development and implementation of a compliance policy</li> <li>• strong and ongoing program of education in the purpose and mutual benefits of the rules</li> <li>• 3 tiered system: 1<sup>st</sup> tier - individuals responsible for compliance; 2<sup>nd</sup> tier – entity imposes restrictions and/or penalties for non-compliance; 3<sup>rd</sup> tier – government</li> </ul>
<b>Resources required</b>	
Funding	<ul style="list-style-type: none"> <li>• to be self funded from levies on members</li> <li>• to cover all costs involved in fulfilling its roles</li> </ul>
Assets	<ul style="list-style-type: none"> <li>• individually-owned water supply infrastructure and metering</li> <li>• telemetry and other equipment of mutual benefit, to be jointly owned by the entity, with contingency provision if entity fails</li> </ul>
Benefits outweigh costs	<ul style="list-style-type: none"> <li>• incentives for forming eg support for transition, advocacy</li> </ul>

	<ul style="list-style-type: none"><li>• leverage funds for additional short-term requirements eg resource rehabilitation, upgrading infrastructure</li></ul>
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## **APPENDIX ONE: INFORMATION SHEET**

### **Inter-jurisdictional analysis of community based governance arrangements (self management) for water resource management**

The Department of Water, Western Australia has engaged Hamstead Consulting P/L to undertake research into existing examples of community based governance arrangements for water resource management in other Australian jurisdictions for applicability in WA. The research will inform and assist in the development of case studies being undertaken in the South West of WA and ultimately the development of a Department of Water policy position.

The analysis is based on 6 case studies from around Australia and aims to provide an overview of each governance model type (corporation, cooperative, and committee) including details about governance structure and membership, funding arrangements, delegations from state body (e.g. department responsible for water resource management for the jurisdiction), etc.

The process includes telephone interviews of up to 45 minutes with key stakeholders involved in existing community-based arrangements for water resource management. Interviews are voluntary and confidential in that information will not be directly attributable to interviewees. Where possible, available written documentation on each case study will be used. Each of the case studies will be written up in a report that will be publicly available once approved by the Dept of Water. We are committing that those who contribute to the study will be notified of the report's availability.

If you have any queries or concerns, please feel free to contact those undertaking the research.

Mark Hamstead, Hamstead Consulting

[mark@hamstead.com.au](mailto:mark@hamstead.com.au)

mob 0438 006 290

Claudia Baldwin, University of Sunshine Coast, Qld

[cbaldwin@usc.edu.au](mailto:cbaldwin@usc.edu.au)

mob 0419 852 322

Vikki Uhlmann, Vikki Uhlmann Consultancies

[vuhlmann@bigpond.net.au](mailto:vuhlmann@bigpond.net.au)

mob 0417 196 412

If you have further queries or concerns about the project, please contact Hazen Cleary, Dept of Water, WA (08) 9726 4188

## **APPENDIX TWO: CASE STUDY INTERVIEW GUIDE**

Much of the detailed information about case studies should be available in written form, either available on the web or able to be sent on request. This interview guide can be used to fill the data gaps by assisting in our search for data and guiding our questions of interviewees; as well as to elicit perceptions and attitudes. The Case Study Outline as presented in the Report Outline has been used as a guide as to the information sought, with questions added to elicit additional information. Some of the topics and questions overlap eg governance and roles.

### **Boundary Definition**

Land area (ha) including map – clarity of boundary, ease of agreement, reviews undertaken?

*What method was used to determine the boundaries? Were there any difficulties in defining the boundaries?*

*Have there been any reviews of the boundaries? Has this changed over time?*

### **Characteristics of area**

- History: when and how initiated, drivers for formation, changes over time,
- Issues
- Socio-ecological system

*What were the drivers for establishing the entity and area? What are the characteristics of the region that meant such an entity was needed or would be useful? eg coordination of an irrigation system; salinity issues?*

*Who initiated the entity? landowners or government? When? How?*

*Any changes in the entity and its operation over time?*

*What are the recent and current issues that you have had to deal with?*

### **Purpose**

Water sharing management (e.g. groundwater/surface water); water distribution infrastructure; security and efficiency initiatives; water plan development; transfer of licences

*What is the purpose and objectives of the organisation? Have they changed over time?*

*Are these transparent? eg on website; in annual report?*

### **Governance arrangements**

- Corporate, cooperative, committee
- Legislative basis; legal structure; delegated authorities from government
- Accountability and transparency arrangements
- Participants and membership (organisational structure and size); overall recognition of the body; evidence of community support; eg water users, other relevant stakeholders, government agencies

*When forming, was there any discussion about the type of body needed eg corporation, cooperative, or committee?*

*What is statutory basis of the organisation? Are there any delegated authorities from government and what are they?*

*How is the governing body organised? Is the structure formalised through a legal mechanism? Eg a board, shareholders? How many members?*

*How is the allocation made? Does an individual hold a state issued entitlement, or a right which is a sub-right of the group entitlement? If the latter, how well defined is it and to what extent is it subject to consent from the organisation to trade or do other things?*

*How are major decisions made, such as about budget, employment, a submission to government about a water plan? Are all members invited to participate? How? Eg voting, consensus? Are members generally involved? Do they influence the decision? Are decisions recorded and rationale made available?*

*What is the major means of communication among members? Eg internet, telephone, regular meetings?*

*What are the key stakeholders that this organization interacts with? Eg which section of government, community. How?*

*Would you say that there is evidence of water user, community and government support for the organisation?*

*How have you addressed major disputes within the organization or with other organizations? Eg any formal mechanism? Personal/political lobbying?*

*Have there been any changes in governance arrangements over time?*

## **Responsibilities and tasks**

Monitoring use including metering, aquifer level and water quality, accuracy of available information; methods of rule-making; communication within group and between group and government; compliance, sanctions and incentives; dispute resolution

*What are the major roles and responsibilities of the organisation? Which are 'formal' eg delegated powers and which are seen as necessary to achieve the purpose or do business in the community? Have there been changes to roles and responsibilities over time?*

*What role does the organisation have in:*

- *Water allocation planning*
- *Deciding water allocations: to the area; among the users within the area?*
- *Achieving best practice in agricultural operations? Any incentives? eg water use efficiency.*
- *Working on environmental health? Any incentives? eg riparian corridors, waste stream management, aquifer health?.*
- *Metering and monitoring water quality and quantity? eg monthly report on aquifer levels to government? Annual report only?*

- *Recovering costs? (more detail below)*
- *Trading and how is it organised?*
- *Compliance? Imposing sanctions and penalties?*

*What are the arrangements for record-keeping and reporting?*

*What is government's role in relation to this body and the designated area?.*

## **Funding arrangements**

Establishment and operational costs, cost recovery, costs and benefits, budget

*What is the size of the budget? What percentage is allocated to various functions: operation of system, administration?*

*What are the arrangements for funding and cost recovery re:*

- *Distribution system construction and maintenance?*
- *Operation of the system?*
- *Administration?*
- *Metering?*

*Is there are charge for water by volume? How is pricing determined?*

*Does the organisation have the ability to levy fees on members? What mechanism is used?*

*What are the costs and benefits of this way of operation? Has there been any consideration of changing it?*

## **Participatory roles and requirements**

Water users, other relevant stakeholders; general community evidence of community support

*Dealt with above under governance.*

## **Linkages**

Organisational and spatial linkages, nesting

*Dealt with above under governance. Any changes over time?*

## **Human resources and capacity**

Skills of group, access to expert information, opportunities for learning, extent of networking or community of practice

*What skills do people need to be a member of your governing body and to be staff?*

*When major decisions have to be made, does the organization seek expert assistance and advice? Give an example.*

*Is the organization used to promote learning among members? Eg field days re best practice, NRM, legislative requirements? How often? Examples.*

*Any changes over time?*

## **Outcomes**

Changes over time including key events, feedback from members, problems overcome, improvement in skills and understanding, alterations to governance, operating or funding arrangements, improvement in water management, other changes considered?

What works well: what the interviewees like about the arrangement

Areas for improvement: what the interviewees think could be done to improve it

*Have there been any major changes over time? eg the organisation, roles, water management?*

*What are some key events or turning points in the organization, the way it operates, its roles, etc.*

*What do you think works well with this arrangement and what could be done to improve it?*

*How do you see the future in terms of this organization? Status quo or are there new issues to address; or different roles?*

*Finally, anything else you would like to mention?"*

*Thank you for your time. We will ensure that you receive a copy of the report once released by the WA Government.*

## **APPENDIX THREE: CASE STUDIES**

### **CENTRAL IRRIGATION TRUST, SA**

#### **BOUNDARY DEFINITION**

The Central Irrigation Trust (CIT) is based in Barmera and pumps from the Murray River. Using a totally piped distribution system, it provides water to 1500 landholdings to irrigate up to 14,000 hectares (10,700 ha is the 10 year average) in 10 irrigation districts in the Riverland Region of S.A. These include the districts of Berri, Cadell, Chaffey, Cobdogla, Kingston, Loxton, Moorook, Mypolonga, Waikerie and Lyrup. CIT also supplies households and industry.

#### **HISTORY AND CHARACTER**

Previous State Government Irrigation Districts combined to form the CIT in 1997. The State government had consciously determined to move out of running irrigation infrastructure. At the same time irrigators had a strong desire to manage the districts themselves. The government established a process of rehabilitating the aging infrastructure (pipes, headworks etc) and assisting in the establishment of the privately administered Trusts, so that they started off on a solid financial footing. Many of the previous government employees who had administered the irrigation districts were transferred to the Trusts. While many private irrigation districts have their own separate Trust, CIT was established to administer several districts, thereby enjoying the benefits of scale.

Each previous government irrigation district was converted to a private irrigation district administered by a Trust at different times. Loxton was converted and joined CIT in 2003. Lyrup joined in 2008 after years of negotiation to bring them up to a standard acceptable to CIT. There are currently negotiations with 3 more irrigation districts wishing to join because of the cost benefits of shared administration and operation and the reputation CIT has gained for effective management. However, before they can join, the district needs to meet 3 requirements:

1. their volumetric allocations are agreed;
2. their voting processes are compliant with legislation (*Irrigation Act 1994*); and
3. their pumping and metering is suitable for unmanned operation by CIT.

The two main issues CIT is dealing with are extremely low allocations and water reforms. Record low inflows into the Murray have meant allocations were cut to 60% in 2006-7. In July 2008, government announced an allocation cap would be maintained at 2% of their normal annual allocation.

The National Water Initiative is seen by CIT as a significant external influence in which it needs to have greater involvement and to advocate on behalf of irrigators. Irrigator districts joined CIT primarily because of the advantages of scale and effective privatised management. With this combined capacity, CIT is better able to engage staff and consultants to deal with the rapid flux of water reform and the implications for its members. As a result, the CIT now does a lot more irrigator support and advocacy with government. There is no reason CIT could not continue to

expand by adding additional irrigation districts along the River Murray, as the advantages of scale would increase.

## **PURPOSE**

The purpose of the CIT is to supply irrigation water and drain excess water and undertake related matters. The unwritten purpose also now includes advocating on behalf of irrigators regarding sustainable water supplies and managing irrigators through the drought.

## **GOVERNANCE ARRANGEMENTS**

### **South Australia generally**

Rural water management in South Australia is administered principally by the Department of Water, Land and Biodiversity Conservation, who are responsible for water policy, and for licensing and compliance under the *Natural Resources Management Act 2004* (the NRM Act). Regional natural resource management boards are responsible for water allocation planning, which sits under regional natural resource management planning, also under the NRM Act.

The Minister has a very broad power to delegate functions under the NRM Act, including the ability to sub-delegate (s 11). The ability to sub-delegate to officers or contractors is an important practical requirement if powers are to be delegated to an independent entity. However to this point delegation of powers has only been given to government agencies.

In South Australia individual private irrigation trusts source water directly from the River Murray and provide retail supply to irrigators. Many of these were originally government irrigation districts, but they have been progressively converted to private irrigation districts administered by private water trusts. This is largely the result of a conscious government policy to move out of administering irrigation infrastructure.

As of Oct 2008 there is only one remaining government district, and the only reason it has not been privatised is that it is currently inoperative and the government is deciding how to deal with it. These trusts are established as legal entities under the *Irrigation Act 1994*. This Act prescribes their functions and powers, governance arrangements and accountability requirements.

Golden Heights, Renmark and Sunlands make up the other three major irrigation trusts in South Australia. South Australia also has many smaller private irrigation trusts with approximate allocations of 8GL or less, typically with only 5 or 6 members. There are 49 trusts in total.

### **Central Irrigation Trust**

There are nine individual irrigation trusts (Mypolonga, Cadell, Waikerie, Kingston, Moorook, Cobdogla, Berri, Loxton and Chaffey) that are collectively managed by the Central Irrigation Trust. The private irrigation trusts are privately owned by the 1478 irrigation members (who contract the Central Irrigation Trust to manage and operate their systems under a 3 year agreement).

The CIT is constituted as a "Trust Incorporated" which is a body corporate (s 18 SA *Irrigation Act 1994*) comprised of the owners of the irrigated properties in a private irrigation district. The owners of each property are entitled to a single vote per

property in relation to the election of Directors and other matters. A CIT representative indicated that a trust company gives powerful ownership to farmers via voting and maintains a closer relationship for farmers with their water. A Trust is also good for taxation advantages because it is a non-profit organisation.

CIT is an irrigator-owned entity. The older Irrigation Districts have been left in place and a Trust structure laid over the top. Each district still has its own independent infrastructure (headwork pumps from the River Murray, distribution systems). CIT provides centralised administration, maintenance and operational management, rather than each having their own staff, information systems, billing systems etc.

The CIT is governed by a Board of Directors which includes a Director elected by each of the 10 Irrigation District Boards at AGMs. The CIT Board oversees day-to-day operations. There are 1500 voting landholder members. The CIT Directors meet with members in district meetings quarterly to discuss the strategic plan, works program, budgets and pricing, trading, and draft submissions to government. Apart from growing to include additional Irrigation Districts, there have been no changes in governance arrangements over time. Because of CIT's transparency of reporting and communicating to members, many members rely on CIT for these decisions.

**The Minister may delegate any of his or her functions or powers under the *Irrigation Act* (excluding the power of delegation) to a Board (s40). A trust may, with the Minister's approval, make regulations about:**

- (a) the provision and maintenance of the irrigation or drainage system of its district;**
- (b) the manner in which irrigation water may be used;**
- (c) maintaining or improving the quality of irrigation water;**
- (d) the drainage and disposal of irrigation water (s45).**

**When the government irrigation districts were privatised, the government-owned open channels were rehabilitated by replacement with pipes. Government did not want to pay for all upgrades, so the Commonwealth provided 40%, and the State 40% with 20% from members, on the understanding that members converted to a private scheme with no more government funds provided.**

## **RESPONSIBILITIES AND TASKS**

The CIT as an Irrigation Authority under the Act may:

- construct, inspect, maintain, repair, replace irrigation infrastructure eg channels, embankments, pumps, pipes,
- control the flow of water in an irrigation or drainage channel or pipe;
- acquire land subject to the Minister's permission;
- extract and remove soil or minerals from land in the irrigation district after first consulting the owner of the land; and
- purchase irrigation equipment, components and tools for resale to its members (s31).

CIT holds a bulk licence for each district, and determines allocations within the district. Properties within the district have defined allocations within the bulk

entitlement. Under the Irrigation Act, CIT ‘must determine water allocations on a fair and equitable basis having regard to the nature of the crops growing, or that will be grown, on the land, the rainfall, the extent to which the soil retains water and all other relevant factors’ (s33(5)). Annual volumetric allocations for each of the properties were determined years ago and left unchanged for many years.

CIT can also vary allocations, with notice, impose or lift restrictions, and impose penalties, though it has not as a practice in the past done so. When the bulk entitlement from the River Murray was first reduced to less than 100% during the current drought (for the first time in living memory), the CIT adjusted allocations by sharing water informally so that everyone could have 100% of their allocation. However, with continuing restrictions in bulk water availability, it was a fight for survival, and when carryover was allowed and trading introduced, farmers’ no longer wanted to share water informally and these adjustments have been discontinued. Available bulk water allocations are now passed on to irrigators distributed pro rata their long established volumetric allocation, regardless of what crops they are growing or plan to grow.

A water allocation is attached to the land to which it relates until it is transferred. A member can apply to transfer all, or part, of a water allocation from one property to another, subject to the approval of the authority. The CIT manages trading – both permanent and temporary – within and across districts. The CIT facilitated trading for 511 members in 2006-7 and organised trading through a broker for 144. CIT also monitors trading and buys water itself to reduce water traded out of area. The CIT is advocating for members to have a separate title for their allocation.

Under the South Australian *Water Resource Regulations 1997*, the ownership of a meter installed to measure the quantity of water supplied by an irrigation authority to an irrigated property is vested in the authority whether it is supplied by the authority or the owner of the irrigated property or by any other person. The CIT reads meters and monitors use and encourages members to monitor use against allocation. It sets a budget and water prices, manages finances, employs staff, and provides commercial advice to individual members.

The CIT can impose government-determined penalties of more than \$1000/ML for overuse of allocation. As the CIT is categorised as a rural water utility under Commonwealth *Water Regulations 2008*, it is required to report information on water quantity, quality data, storages, weather, water use, entitlements and trades to Bureau of Meteorology. Under the National Water Initiative Rural Performance Reporting requirements, it also provides crop and other data to NWC.

Within one month of a decision of the Minister or a trust, a person may appeal to the Environment, Resources and Development Court about:

- inclusion or exclusion from a an irrigation district;
- the basis of charges;
- the allocation; and
- other related matters (s65).

CIT generally supports members; it advocates to government on behalf of members and keeps members informed. It organises training such as joint irrigation efficiency training days run by other organisations, such as SA Murray-Darling NRM Board,

leading to a significant increase in use of drip irrigation. The CIT promotes irrigation efficiency through training days and installing smart metering.

CIT provides web-based reports on salinity, rainfall and weather. Automated usage reports are provided to farmers every 15 minutes. There is no aquifer use or measurement.

**Apart from some leading farmers and the CEO's membership on catchment committees, the CIT does not play a significant role in environmental health/NRM in this area.**

## **FUNDING ARRANGEMENTS**

CIT is totally self funding. The budget is \$8.2 million total, with revenue and expense of each Irrigation District Trusts attributed to that Trust. Those not directly attributable (salaries, insurances, Directors costs, administration etc) are apportioned according to each Trust's proportion of water allocation. Most years, 64-70% of revenue comes from water sales to irrigators; this is a stable situation because there is a lack of seasonal variation in demand as the horticultural crops grown there need water all year round. Other funding sources include domestic sales (11%), interest on investment (7%), industrial sales and catchment levy (each 5%), grant (3%) and other (5%).

Capital works are funded from trading funds and distribution system replacements from the substantial Reserves.

The members, through the Trust, own the infrastructure (headwork pumps, distribution pipes, drains etc) and everyone is charged on a common fee scale for the above services. CIT has consumption-based pricing with a service charge of 18% + consumption price 82% of the total charge. The CIT won \$2.3M in WaterSmart Australia funding for telemetry, in particular for installation of \$8M worth of automated remote meter reading.

The CIT charges an exit/termination fee for members selling up (based on the net present value of their fixed costs), which is not appreciated by about 1% of the members to whom this applies, but is supported by the remainder. This year (2008) is difficult because CIT will be raising prices more than CPI to fund the backlog of works, so they are keeping up regular discussions with members beforehand.

## **PARTICIPATORY ROLES AND REQUIREMENTS**

In relation to communication with members, CIT provides regular newsletters, graphs and news of government decisions and traders contacts over the net. Members can order water and trade over the net. CIT produces simple and colourful graphs showing water allocation and use, which according to a CIT representative 'are so user-friendly they are now being discussed' within families.

Members meet at least quarterly. Only about 100-200 farmers regularly participate in meetings. The CEO takes an approach of regular communication and advocates 'listening rather than selling'. Prior to the AGM, several rounds of district meetings are held to ensure members are fully informed and that their concerns are understood. If members oppose something, CIT does not do it, and they've only ever had a maximum of 3 no votes in their member meetings. CIT used to "get thrashed in public meetings a long time ago, but has not had any bad press for over a decade". CIT does not have a formal dispute resolution process.

## LINKAGES

In terms of key stakeholders, CIT interacts with the PID's, Renmark Irrigation Trust, Riverine Local Action Plan Committees, Berri Barmera Local Action Plan Committee, and statutory authorities such as River Murray Catchment Water Management Board to organise training courses in irrigation efficiency.

## HUMAN RESOURCES AND CAPACITY

The Board of Directors is voted in by members and generally there is a good working relationship between the Board and staff. The CIT advertises and hires staff itself. It has 31 staff with little turnover. This is attributed to the CIT being well regarded for its performance and technology. Younger staff are now much more highly qualified than previously. CIT has an Employee Relations Enterprise Agreement.

CIT generally resolves decisions themselves. Occasionally expert advice is sought eg when introducing an IT project; however in this case it was so expensive and removed control from CIT, so CIT decided to proceed on their own.

## OUTCOMES

The organisation has grown, and has taken on an information, support and advocacy role for their members, which is above and beyond their legislated mandate. A great deal of effort is now put into managing members through the drought, with the result that last year not one member exceeded their allocation.

While the CIT supports the National Water Plan, restrictions and a much more complex water world has led to a need to advocate extensively to government. Because of the challenges now being faced by irrigators, CIT now appears to advocate on behalf of all 49 irrigation districts in SA, an activity which is also above and beyond that required of it.

**CIT believes that SA has the best Trust model. A trust company has taxation advantages, but what is more important than the governance structure is the philosophy. In CIT's case, the key overarching philosophy is that the farmers own the infrastructure and the water, and as they are facing tough times, it is the irrigation entity's job to manage the water risks and deliver their water. It is seen as the CEO's job to ensure members also adopt this attitude; it is not a case of "us and them".**

**From a government agency point of view, CIT is considered to be a very effective organisation which has been proactive in promoting best practice on-farm water management and introduction of beneficial technologies such as best practice telemetered metering.**

In the future CIT sees that there will be fewer farmers, less water sales and poorer produce margins, but those who remain will need the combined critical mass of CIT to enable them to continue to survive. In the next decade, better information will be provided to farmers to improve their understanding and management of their allocation, and irrigation technology will be improved. And there will be more advocacy.

**One of the major challenges facing CIT and other Trusts is the buy out of water entitlements and large reductions in water availability in the southern connected Murray Darling system, and the COAG driven pressure to allow individuals within districts to freely trade their water entitlements out of the district. Within**

**District water entitlements which are traded out mean greater costs for those remaining and the possibility of stranded assets. The one difficulty from an agency point of view with the Trust model is that the water entitlements are actually held by the Trusts at the bulk level. Irrigator entitlements within the districts are internally administered. Thus the government always has to go through the Trust to deal with individuals.**

**According to the agency, CIT has recognised the changing situation and has shifted its thinking towards moving to a different business model, where it moves from being a supplier to irrigator members of water it owns, to being a water delivery service for water owned by individual members. However there is not yet agreement to this change at a state level and legislative change would be required for it to occur.**

## **REFERENCES**

Berri Barmera Local Action Planning, for information about environmental actions  
[http://www.bblap.org.au/BBLAP/18\\_irrig\\_wue\\_proj.htm](http://www.bblap.org.au/BBLAP/18_irrig_wue_proj.htm)

Bureau of Meteorology, for information about reporting requirements  
<http://www.bom.gov.au/water/regulations/report-summary.php?personid=33>

Central Irrigation Trust, *Annual Report 2005-6*, CIT Barmera SA 2006

Central Irrigation Trust, *Annual Report 2006-7*, CIT Barmera SA, 2007

CIT website: [www.cit.org.au](http://www.cit.org.au) for general information

Interview: CEO CIT, 15/8/08

Interview: DWLBC agency officer, 1/10/08

## **Legislation**

*SA Irrigation Act 1994*

[http://www.austlii.edu.au/au/legis/sa/consol\\_act/ia1994131/](http://www.austlii.edu.au/au/legis/sa/consol_act/ia1994131/)

*SA Natural Resources Management Act 2004*

[http://www.austlii.edu.au/au/legis/sa/consol\\_act/nrma2004298/](http://www.austlii.edu.au/au/legis/sa/consol_act/nrma2004298/)

*SA Water Resources Regulations 1997*

[http://www.austlii.edu.au/au/legis/sa/consol\\_reg/wrr1997306/](http://www.austlii.edu.au/au/legis/sa/consol_reg/wrr1997306/)

*Commonwealth Water Regulations 2008*

<http://www.frli.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/0/3B3AF3E9B64EAED7CA25746C000F5FA3?OpenDocument>

## **ABERCROMBIE PUMPING ASSOCIATION, NSW**

### **BOUNDARY DEFINITION**

The Abercrombie Pumpers Association (APA) administers a water supply scheme supplying 12 properties (total area 200,000 ha) with water for stock, domestic and irrigation purposes. The scheme draws water via pump headworks from the regulated Murrumbidgee River into a system of approx 200km of channels that distribute water to the properties. Land supplied by the scheme was defined in the original licence issued under the *Water Act 1912* to the APA to construct and operate the works. It is made up of the properties of the applicants at the time of the initial application, though ownership has changed over time.

### **HISTORY AND CHARACTER**

Established in 1966 by a group of farmers acting cooperatively, the APA has continued operation since that time with little change, except that the number of members has fallen as some properties were bought out by other members. Management arrangements are generally less formal than larger entities, with considerable reliance on ongoing good will and cooperation between members.

The regulated Murrumbidgee River, from which the APA draws its water, is a normally very reliable source of water. A part of the APAs water licences are stock and domestic licences, which have a very high priority and are only given less than full allocations in extremely dry years. The bulk of their water licences are general security which has allocations which vary from year to year, from zero to 100%. They are used for irrigation of annual crops. Up to the recent drought the general security licences were expected to deliver 100% in approximately 90% of years, but climate change seems to be reducing that reliability.

Current challenges include the recent run of very low water allocations, and dealing with one of the members wanting to sell their share of the water entitlements.

### **PURPOSE**

APA operates for the purpose of efficiently supplying water to its members.

### **GOVERNANCE ARRANGEMENTS**

#### **NSW generally**

The Department of Water and Energy administers the *Water Management Act 2000* on behalf of the Minister. The Act allows any person to hold a water licence, and any landholder to construct and operate works to take and distribute water from a water source, subject to obtaining an approval from DWE.

Historically it was not uncommon for groups of landholders to seek and obtain a licence to construct shared head works and distribution works to take water and distribute it to multiple properties. There are over 2000 of these in NSW (they also exist in substantial numbers in other states). The majority are small, constituting less than 5 properties. Some are large with a small number having over 50 properties.

From the government's point of view they are just like any other water licence holder, except that because there are multiple parties involved they have to put in place their own internal arrangements for sharing water and sharing costs, which the government

has no involvement in. They have no statutory powers to access land to construct works, read meters etc so this is done through private informal or contractual arrangements. The types of governance arrangements they establish between themselves varies from totally informal (typically family) arrangements, through partnerships, incorporated associations, companies and cooperatives.

There have been many of these shared works arrangements which have failed. These have been amongst the smaller ones, typically because one or more parties pull out making it no longer viable, or because of disputes between parties.

The Act provides for delegation of some powers (eg to enter, construct, impose fees, etc) to 5 specifically listed Irrigation Corporations; and Private Irrigation Boards, Water Authorities and Trusts created under the Act. It does not expressly provide the ability to delegate powers to other organisations such as privately established incorporated associations or companies. The Act includes a general power of delegation but it has not been exercised to give powers to other entities, and it is uncertain whether it can be effectively used for this purpose.

Thus schemes such as the Abercrombie rely on their privately organised arrangements to maintain and operate the scheme. The government provides no support nor has any involvement in their internal operations. Government agencies are concerned only that the bulk water taken is within the allocations provided to the scheme as a whole.

## **Abercrombie Pumping Association**

APA is an incorporated association registered under NSW state legislation (*Associations Incorporation Act 1984*). Despite its significant financial turnover there has never been any need to move to anything more complex.

The APA has 8 members who are the current owners of the 12 properties supplied under the scheme. The reason an incorporated association was selected over alternatives in 1966 is not known, though presumably it related to the reasons listed above.

The APA is governed by an executive committee of 6 elected by the members at the annual general meeting, and is subject to a constitution. The executive committee meets as needed for decisions, but routinely meets 3 to 4 times a year. Disputes are rare as members generally work together for mutual benefit. However where a member does not abide by rules or meet obligations agreed by the majority, the obligations are enforced by simply cutting off supply of water.

The APA owns the headworks and major channels. The water access licences (entitlements to take water from the river) are not however held by the APA. They are held by all the members jointly as tenants in common, with the proportional share of each member of the entitlement represented on the licence. Should the APA ever be dissolved the assets would revert to the members.

## **RESPONSIBILITIES AND TASKS**

The primary obligation of APA is to maintain and operate the works to deliver water to the properties of members.

APA members jointly hold a 6500 ML stock and domestic licence and a 17000 ML general security licence, with individual shares in the entitlements set out on the licence. Water is distributed as requested by members in relation to their proportion of the bulk water allocation made available by State Water at the river pump.

Transmission losses are determined and distributed pro rata between members regardless of their location in the distribution system. Delivery is metered at offtakes using dethridge wheels.

The APA also has a role in water trading. There is a history of temporary trading between members and one permanent trade between members. Recently one member chose to permanently trade out of the scheme. This was against the wishes of the other members, but was accepted by the executive committee as it was likely that the member would take the matter to court and succeed regardless. The member paid an exit fee to cover the loss of funding for maintenance of the operating assets.

APA has an accountant prepare annual financial accounts for the benefit of the members. It has no tax obligations or statutory reporting requirements.

### **FUNDING ARRANGEMENTS**

Members are levied fees sufficient to cover costs. Stock and domestic supply is charged per acre and irrigation is charged per unit of entitlement. Typical annual fees from the 8 members total around \$300 000 to \$400 000.

Costs to be covered include:

- employment of a full time water bailiff to operate the scheme and undertake basic maintenance
- employment of a part time secretary and accountant
- remuneration to executive committee chair \$10k/yr
- vehicle, tools, parts etc
- state charges for water at the headworks (\$100,000 to \$350, 000 per year depending on volume taken)
- payment into a capital replacement sinking fund.

### **PARTICIPATORY ROLES AND REQUIREMENTS**

With total membership of 8, communication is easily managed as needed through ad-hoc fax or telephone calls.

The executive committee chair manages external relations as needed and directs staff. With 6 out of 8 members being on the executive committee, there is a high level of ongoing participation. Significant decisions involve all members.

### **LINKAGES**

The APA has involvement with State Water in relation to bulk water access at the headworks (water ordering etc).

The APA is a member of the NSW Irrigators Council.

### **HUMAN RESOURCES AND CAPACITY**

The APA rely heavily on their water bailiff to manage the system and they value his services highly. For non-routine matters the Committee contracts additional expertise as and when needed.

## OUTCOMES

The association members are satisfied that the current arrangement works well in meeting their common interest of cost effective supply of water to properties. There is continual good will between members. They believe it has been hugely beneficial for the economic stability of the district.

Agency officers view APA as a demonstratedly successful entity. Speaking generally of such organisations, the Department has a policy of keeping totally away from their internal arrangements. The Department is only concerned that the total water taken from the River is within the volumes allocated, and that bills are paid. Non-compliance would lead to enforcement actions such as water licence suspension. There have not been any problems with APA in this regard.

As with CIT, a significant issue facing such entities in the Murray Darling Basin is the buy out of water entitlements and large reductions in water availability in the southern connected Murray Darling system. The trade out of water entitlements from entities such as APA mean greater costs for those remaining and the possibility of stranded assets. This happened with APA as was outlined above. There are often disputes between a member of an entity such as APA who wants to permanently trade out water entitlements, and the other members of the entity who do not want them to. NSW legislation attempts to provide fair mechanisms, which generally require majority agreement, but gives the individual recourse to the courts if the majority are being unreasonable.

## REFERENCES

Information obtained from interview with a member of the APA Board and with an agency officer, plus personal knowledge of the consultant who documented the case study (who formerly worked for many years for the Department).

### **Legislation**

*NSW Associations Incorporation Act 1984*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/aia1984307/](http://www.austlii.edu.au/au/legis/nsw/consol_act/aia1984307/)

*NSW Water Act 1912*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/wa191283/](http://www.austlii.edu.au/au/legis/nsw/consol_act/wa191283/)

*NSW Water Management Act 2000*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/wma2000166/](http://www.austlii.edu.au/au/legis/nsw/consol_act/wma2000166/)

# BEGA VALLEY WATER USERS ASSOCIATION INC, NSW

## BOUNDARY DEFINITION

Bega Valley Water Users Association Inc (BVWU) operates in the catchment of the Bega River on the south coast of NSW (see Figure 2). The Bega River catchment covers approximately 2,000 square km of the NSW far south coast. The catchment drains into two major rivers (the Brogo River and the Bega - Bemboka River) which meet at the town of Bega, about five km above the start of the Bega River estuary. The catchment is a broad basin, which is rimmed by the NSW south coast escarpment, approximately 50 km inland from the coast. About 60% of the valley was cleared for farming in the 19<sup>th</sup> century.

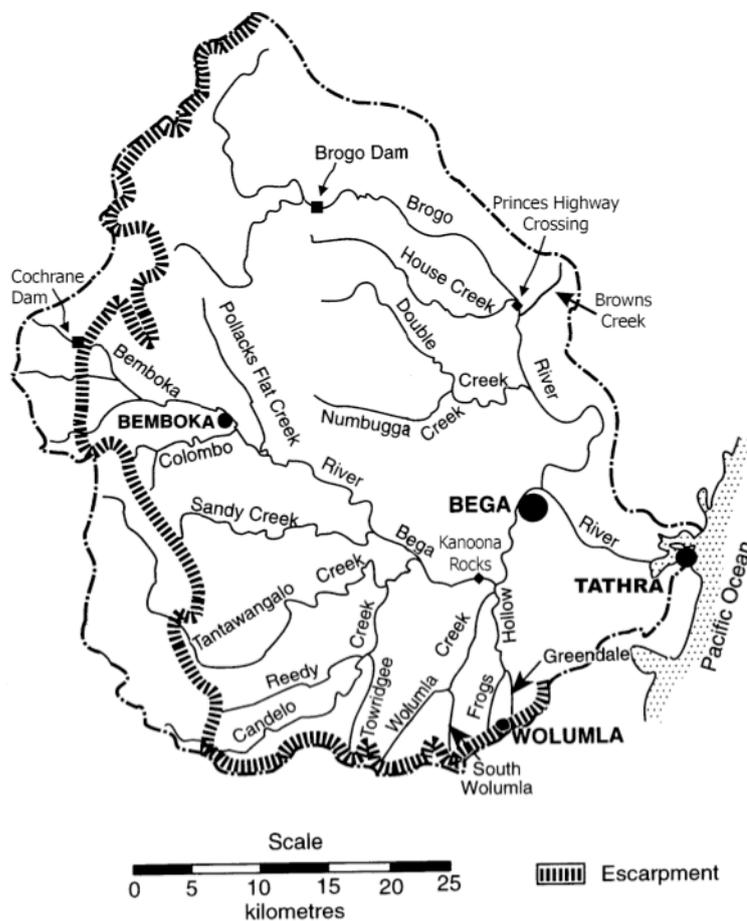


Figure 2: Bega Catchment (source Healthy Rivers Commission (2000))

## HISTORY AND CHARACTER

The Bega valley has a long heritage of dairying and beef cattle grazing. An analysis of the regional economy and water reform impacts in 1999 concluded that ‘the dairy industry dominates the Bega Valley economy and is a model of the way primary industries should operate to maximise downstream value–adding and secure markets’

(Powell & Chalmers, 1999). The industry comprises over 100 dairy farms in the valley which cooperatively own the cheese processing and packaging plants, directly employing approximately 500 in the factories and indirectly a further 500 people on farms. The Bega Cooperative was established in 1899 and Bega Cheese is today a national brand name with a growing export market.

Extraction from the local rivers to irrigate ryegrass pastures for dairy production began in the 1970's and grew rapidly in the 1980's driving the increases in production that were necessary for the industry to remain viable. By the early 1990's the major part of the valley's milk production was reliant on irrigation. About two thirds of farms are reliant on self supply water from natural stream flows in 'unregulated' rivers in the valley. The remainder take water from the 'regulated' Brogo River.

Established in 1965 by irrigators in the valley, the BVWU was initially set up to facilitate sharing of water taken by self supply irrigators in the Bega River catchment during periods of very low flow. At that time government agencies had little involvement in water management in coastal unregulated rivers. This role has continued. In recent years (since the early 1990s) BVWU has increasingly adopted a broader role of representing its members in local, state and federal government forums; making submissions on water related matters and developing improved water supply options.

There are two major dams in the Bega catchment. Brogo Dam on the Brogo River is operated by State Water to provide regulated flows for extraction for irrigation, riparian use and reticulated supply to Bermagui and Cobargo. It has a storage capacity of 9,800 ML and a catchment area of about 400 square km, about half of the total Brogo River catchment. Cochrane Dam on the upper Bemboka River, operated by Eraring Energy for power generation, has a capacity of 2,700 megalitres and a catchment area of about 30 square kilometres, about 3-4% of the Bega-Bemboka catchment at the Brogo River junction.

Stream flows in the Bega valley are highly variable and rainfall is unpredictable. The valley's sub-catchments are short and steep, with only three or so days' flow between the headwaters and the sea. Many tributary streams typically have low 'base flows' (groundwater inflow from forested headwaters) or less for about 30% of the time. The lower Bega River has a wide channel filled with sand, providing a limited underground water storage for water users in that area.

## **PURPOSE**

BVWU now has three functions:

1. facilitating sharing of water during periods of water shortage
2. advocating on behalf of its members in government and industry forums
3. developing enhanced water supply options for its members.

## **GOVERNANCE ARRANGEMENTS**

### **NSW generally**

The Department of Water and Energy administers the *Water Act 1912* and the *Water Management Act 2000* on behalf of the Minister. The *Water Management Act 2000* is being phased in across NSW through development of statutory water sharing plans

and conversion of *Water Act 1912* water licences to unbundled NWI style water access entitlements (called water access licences in NSW) and approvals for works and use of water on land. This has not yet been completed in the Bega Valley. Apart from basic rights to stock and domestic water, all water extraction requires a water licence in NSW.

The Act provides for delegation of some powers (eg to enter, construct, impose fees, etc) to 5 specifically listed Irrigation Corporations; and Private Irrigation Boards, Water Authorities and Trusts created under the Act. It does not expressly provide the ability to delegate powers to other organisations such as privately established incorporated associations or companies. The Act includes a general power of delegation but it has not been exercised to give powers to other entities, and it is uncertain whether it can be effectively used for this purpose.

## **Bega Valley Water Users Association**

BVWU is an incorporated association registered under NSW state legislation (*Associations Incorporation Act 1984*). BVWU chose to incorporate approximately 15 years ago. The main reason was to limit liability for office bearers and members, the decision being taken based on advice from an accountant. There was no need to become anything more complex.

Membership is open to irrigators within the valley with an authorised area greater than 5 ha. There are approximately 65 members. The management committee consists of elected representatives from each of the 8 rivers within the Bega catchment and an honorary secretary (who is an accountant). The committee elects a chairman from its members.

BVWU does not have any hard assets, though it can and does collect and hold funds for various purposes such as to commission studies. Each irrigator in the valley has their own pumps and distribution works, taking water directly from rivers.

BVWU is a voluntary organisation. There is no obligation for irrigators to join. Payment of annual fees is consequently voluntary also (failure to do so simply leads to lapse of membership). However most irrigators are members and lapses of membership are few (though multiple reminders are needed for some).

While BVWU has from the beginning worked to facilitate sharing of water in times of low flow, it has no powers to enforce water sharing or monitor extraction. It relies on the Department to do this.

## **RESPONSIBILITIES AND TASKS**

Each irrigator in the Valley has their own licence(s) to take water and operates as a self supplier from a river. There is heavy competition between irrigators for access to low river flows, which often last for extended periods. For many years this resulted in conflict and over-exploitation during low flow periods. By the early 1990's BVWU had begun working with the then Water Resources Department to put into place basic rostering arrangements on the unregulated Bega / Bemboka River to ensure equitable sharing of the available water.

In the mid-1990's the Bega Valley Water Management Committee was established to work with the Department to identify environmental flow requirements and to formalise the water rostering arrangements for the unregulated Bega / Bemboka River in a 'river flow plan'. The Committee included representation from BVWU,

environmental interests, local government and government agencies. The Bega / Bemboka River Flow Plan was the result of three years of studies and negotiations, steered by the Committee between 1996 and 1998. Under the Flow Plan every irrigator has a 'time and event' electricity meter linked to a calibrated pump and is required to conform to daily extraction limits. These limits are set according to the daily river flow, so that the specified environmental water is always protected. A 'Cease To Pump' restriction is declared when flows become very low, so that river pools and riffles are maintained. This plan has strong support from the 30 irrigators involved.

The Department has implemented the plan by adding the daily extraction limits for different river flows as conditions on licences. A Departmental officer records a message on an answering machine stating what restrictions are currently in force, and irrigators check the answering machine when the river is low. Each pump has had a calibration factor determined which specifies the number of hours of operation that corresponds to the daily rate. Pumps are linked to electricity meters, which record electricity usage timing as well as quantity. The Department checks actual pumping retrospectively though periodically downloaded electricity meter information, obtained by arrangement with the local electricity utility.

According to the BVWU Chair, one of the important factors in the successful operation of the Plan is that everyone knows that they are being 'watched'. At the current moment plans are underway to improve on the current retrospective checking arrangement by moving to real time monitoring through installation of telemetered water meters linked to a web site. The Department is arranging for this with support from BVWU, and will operate the telemetry system and provide the data management and website.

Another important factor has been the strong support from a local Departmental officer who has worked closely with the irrigators to implement the Plan at a practical level and operationally support initiatives such as the arrangement with Eraring Energy. One innovative scheme facilitated by BVWU was the commercial arrangements between Bemboka River irrigators and Eraring Energy whereby releases of water from Cochrane Dam would be made at times that suit the irrigators, but which may be less than optimal for electricity generation.

BVWU is currently working on a proposal to construct an additional off-river storage on Candelo Creek to allow further improvement of water supply during dry periods. The other significant role played by BVWU is to represent the interests of its members in larger forums. For example BVWU regularly lodges submissions to the NSW Independent Pricing and Regulatory Tribunal (IPART) on water pricing; is a stakeholder in local water plan development; engages with the local environment group; is a member of the NSW Irrigators Council and a member of the Bega Shire Council water committee.

BVWU has an accountant prepare annual financial accounts for the benefit of the members. It has no tax obligations or statutory reporting requirements.

## **FUNDING ARRANGEMENTS**

Members are levied a fee of \$50 per year. This covers basic costs (expenses for travel, administrative support, public liability insurance etc). Otherwise the Executive organises special subscriptions for particular items (eg to fund commercial

arrangements with Eraring Energy regarding timely releases of water from Cochrane Dam).

BVWU has no employees and does not pay any of its elected officers. General administrative support (keeping minutes, paying bills etc) is provided by a person contracted at an hourly rate. This typically amounts to about \$1500/year.

Bega Cheese Limited supports BVWU through providing meeting facilities, helping with coordination of payments for arrangements such as that with Eraring Energy, assistance with communication through its newsletter and on farm extension.

The Department charges irrigators annual licence fees independently of BVWU. Annual fees are intended to recover costs incurred by the Department in management of the river – studies, monitoring, operations, etc. These fees are set by the state government's Independent Pricing and Regulatory Tribunal, but are set at a broad regional level (eg all the coastal catchments south of Sydney rather than catchment by catchment).

## **PARTICIPATORY ROLES AND REQUIREMENTS**

The only fixed meeting is the Annual General Meeting of members. The management committee meets as needed. Committee members are not required to attend all meetings, and in practice attendance of particular members depends on the purposes for which the meeting is called. For example, if the meeting concerns the regulated Brogo River then only the members from the regulated Brogo and the Chair need attend.

The principle mechanism for communication between the Executive and the members is the weekly Bega Cheese newsletter to farmers. Bega Cheese provide BVWU with the opportunity to include items as and when needed for no charge.

## **LINKAGES**

As discussed above, BVWU works closely with the Department on operational flow sharing. It is also represented on State Water's Coastal Customer Service Committee, Bega Shire Council's water committee and is a member of NSW Irrigators Council.

As mentioned above, Bega Cheese Limited provides ongoing logistical support to BVWU.

## **HUMAN RESOURCES AND CAPACITY**

BVWU relies heavily on the voluntary commitment of its elected representatives. The current Chair has been in the office for over 1 year but has been a member of the management committee for 11 years, and the previous Chair was there for 22 years. BVWU has a long serving Hon Secretary, who is a local accountant who does the annual financial statements and provides advice as needed for no charge. There is also an Hon Solicitor who provides ad-hoc legal advice for no fee. Positive technical support from a local Department officer in establishing operational water sharing has also been very important.

## **OUTCOMES**

BVWU asserts that it is strongly supported by local irrigators, and has been very effective in achieving water supply and water sharing outcomes and in representing

the interests of the members generally. The organisational structure is effective for the purpose – no changes are planned.

An agency officer who has worked closely with them for several years indicated that BVWU is a very robust forward thinking organisation which has gained a lot of credibility locally and with state government. It would be theoretically feasible for BVWU to take on further government water management functions, but there are no plans from government to do so, and BVWU have not pursued this.

A representative of Bega Cheese noted that the success of BVWU has been, and continues to be, heavily reliant on the passion and commitment of the chair and a few others. Additional contributors to success include the willingness of Department officers to contribute time and effort, the common interest of nearly all the irrigators in the valley who are dairy farmers linked to Bega Cheese, and the support of Bega Cheese.

## REFERENCES

The main source of information were interviews with the BVWU Chair, an officer of the government water agency Dept of Water and Energy and a representative of Bega Cheese Ltd.

Powell, R. & Chalmers, L. (1999) *Economic Profile for the Bega Valley LGA: Report to Bega Valley Water Management Committee*. Armidale NSW: Centre for Agricultural and Regional Economics.

Healthy Rivers Commission of New South Wales (2000) *Independent Inquiry into the Bega River System: Final Report May 2000*. Sydney NSW.

McPhee, D (2004) *The Bega River Health Agreement: From Walkout to Win/Win*, provided by the author.

## Legislation

*NSW Associations Incorporation Act 1984*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/aia1984307/](http://www.austlii.edu.au/au/legis/nsw/consol_act/aia1984307/)

*NSW Water Act 1912*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/wa191283/](http://www.austlii.edu.au/au/legis/nsw/consol_act/wa191283/)

*NSW Water Management Act 2000*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/wma2000166/](http://www.austlii.edu.au/au/legis/nsw/consol_act/wma2000166/)

# NORTH AND SOUTH BURDEKIN WATER BOARDS, QUEENSLAND

## BOUNDARY DEFINITION

The North and South Burdekin Water Board areas of operation cover 48,530 ha in the delta of the Burdekin River south of Townsville in Queensland. The area benefited from irrigation management is 26,222 ha and most of that is under sugarcane (25,215 ha). There are 1007 ha under small crops. North Burdekin has a land area of 12,000ha and 400 members and South Burdekin has a land area of 13,000ha and 250 members.

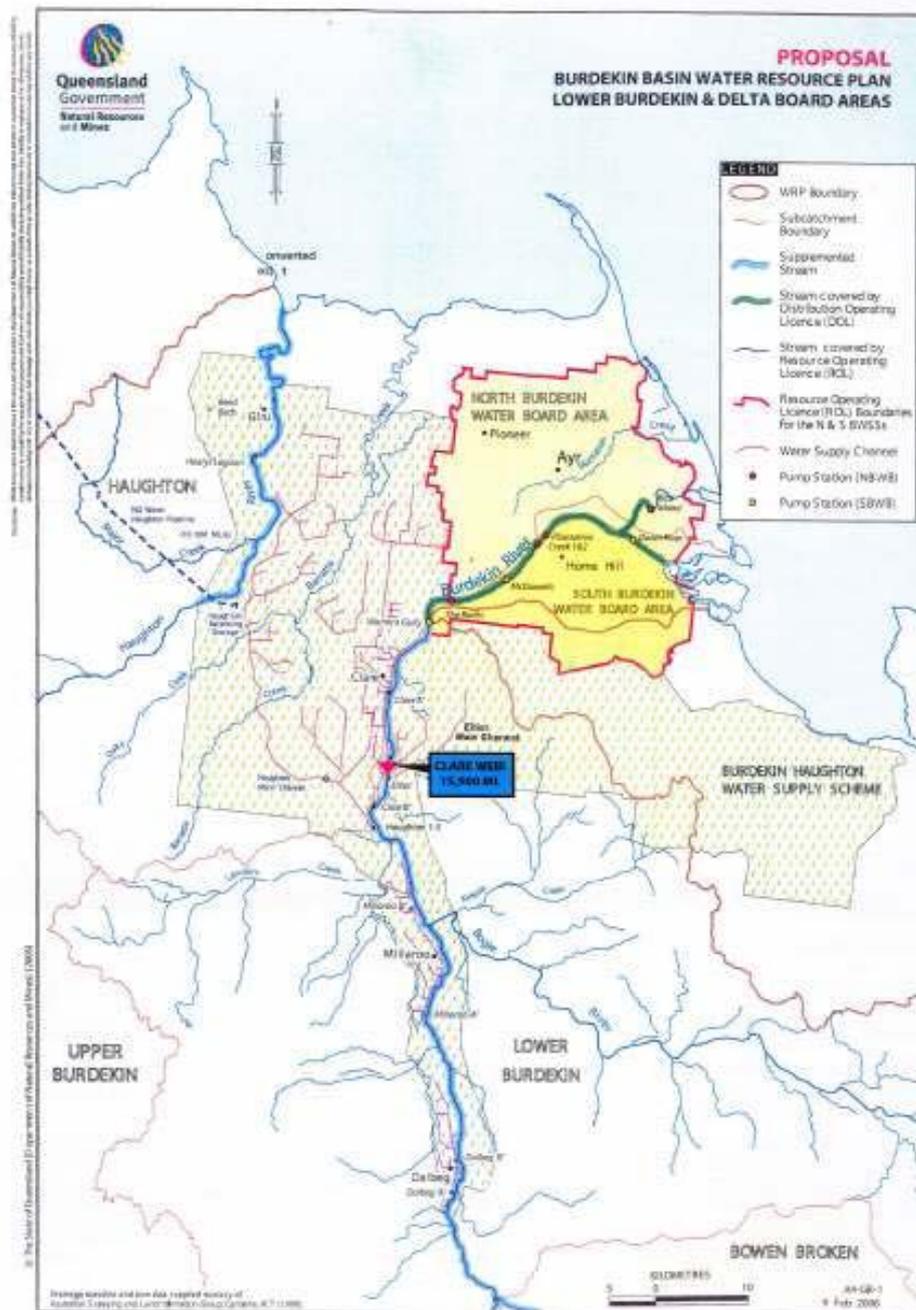


Figure 3: North and South Burdekin Irrigation Areas (Natural Resources and Water)

## HISTORY AND CHARACTER

The North and South Burdekin Water Boards (NBWB, SBWB) were originally constituted by Order in Council in 1965 and 1966 respectively and continue to operate under the *Water Act 2000*. The North and South Burdekin Water Boards have formed a joint venture 'Lower Burdekin Water' (which came into effect in Sept 08) for administration, operational and regulatory compliance reasons, while retaining their individual entities.

The Boards were initially formed 'in response to critically declining groundwater levels brought about by the combined effects of a major increase in the area assigned to sugar cane and several years of inadequate natural replenishment resulting from drought conditions at that time' (North Burdekin Water Board 2006). The Burdekin District is the largest cane growing area in Australia and the Burdekin River delta has an extensive coastal aquifer system which (when full) represents a storage in excess of 1.23 million ML. Study of the aquifer system deemed it possible to artificially replenish the underground basin and use it as a storage (North Burdekin Water Board 2006).

There are 413 'open' water licences (for channel irrigation). It is estimated that there are 800 unmetered production bores for groundwater.

Groundwater extraction is the predominant source of irrigation with surface water releases from the Burdekin Dam supplementing groundwater for irrigation. Since virtually none of the groundwater extraction is metered, a guestimate is that surface water provides a majority of the water used for irrigation in the NBWB area, whereas groundwater provides a majority in the SBWB.

The main charter of the Boards was to artificially replenish the Burdekin delta groundwater resource within their respective water areas. The operation of the regional groundwater recharge scheme includes:

- Direct recharge of the aquifer through artificially constructed soakage pits, where water pumped from the river during times of release from the Dam and wet season flow is diverted into these pits and percolates into the aquifer (mainly in the SBSB)
- Recharge through the bed and banks of natural watercourses and artificial channels, which form a large part of the Board's distribution system
- Direct supply of water to irrigators, thereby conserving groundwater and lessening the need for artificial replenishment
- Maintaining water levels and water quality within the aquifer.

With lack of meters, it is difficult to develop a water balance to determine how well the recharge system is working. Recharge operation is reported to be reactive, imprecise, and not based on science. To give an indication of the artificial recharge works, in 2005-2006 a total of 147,260 ML of groundwater was delivered into the North Burdekin irrigation system, 8740 ML below the Board's nominal allocation of 156,000 ML. Some 62% (93,317 ML) was supplied directly as open water supply to irrigators, the remainder less evaporation and transpiration percolating into the aquifer. Riparian irrigators (surface water) 'delivered' 8820 ML into the area. The net effect on the aquifer of both natural and artificial recharge was an average rise of 0.1m in groundwater levels across the district from June 2005 to June 2006.

Over recent years water quality issues have become apparent in several coastal areas of the Lower Burdekin aquifer. In one area leakage from aquaculture and agriculture and saltwater intrusion has threatened the freshwater aquifer and associated environment. The two Boards funded a remedial strategy to address the issue. In other areas close to the coast, groundwater salinity levels have been steadily rising. At present the salinity levels allow continued use of the groundwater for irrigation but the Boards are proactively moving to put in place strategies to ensure the groundwater resource continues to be used in a sustainable manner. A recent CSIRO study concluded that although there was a lack of data, the main cause of groundwater salinity increase is the volume of water extracted from pumps in the area, resulting in up-coning of the saltwater / freshwater interface. The study made a number of recommendations to help manage the groundwater resource including metering of pumped volumes, supplementing groundwater with surface water, continued monitoring of salinity and moderation of water use through efficient irrigation practices.

## **PURPOSE**

The function of the Boards is to utilise part of the flow in the Burdekin River to replenish the subterranean water supply in the Burdekin River delta and to ‘thereby increase the quantity and improve the quality of the supply available from this source for irrigation, domestic, stock and industrial and urban purposes’ (South Burdekin Water Board 2008). They are ‘to construct works of improvement of subterranean water supplies and to constitute a Board for constructing, maintaining and administering such works’ (South Burdekin Water Board 2008).

## **GOVERNANCE ARRANGEMENTS**

### **Queensland generally**

The Department of Natural Resources and Water (DNRW) is responsible for water resource planning and for administration of water entitlements and compliance generally pursuant to the *Water Act 2000*. Maintenance and operation of water supply infrastructure is undertaken largely by SunWater (a government corporation) which operates 27 water supply schemes across the state and all the major rural water dams.

SunWater provides wholesale water to a number of statutory water boards, the largest being the North Burdekin Water Board, Pioneer Valley Water Board and South Burdekin Water Board. These rural water boards, in turn, supply retail water to a range of users, including irrigators and landholders (for stock and domestic purposes).

The Act allows the Minister to establish ‘water authorities’ (such as the above-listed boards) by regulation. The Act makes these authorities legal entities and gives them a range of statutory powers, including to construct works enter land, raise levies etc. The establishing regulation sets out how directors are to be appointed (by election or by nomination or by a combination) and the authority area of operations and functions. The Act does not provide any ability to delegate statutory powers to external entities.

The Burdekin Boards were chosen as a case study because they have been operating viably for more than 40 years and were established with the purpose of aquifer management, considered relevant to the WA situation. There are, though, two other

cases in Queensland that are of interest to this study – the Pioneer Valley Water Board and the Lockyer Water Users Forum.

The Pioneer Valley Water Board with 251 members and based in Mackay, has recently formed the Pioneer Valley Water Cooperative Ltd to gain local ownership of the irrigation scheme. They ‘see the move to a co-operative as vital to ensure that water charges to irrigators remain under full local control and not subjected to Government influences’ (PV Water 2007). It was reported that it would also reduce the perceived onerous service and reporting obligations of statutory authorities. In May 2008 the Queensland government amended the *Water Act* to formalise ‘the requirements for conversion of water authorities into alternative institutional structures’ (PV Water 2008), similar to the process for establishing water authorities. This is being progressed.

One of the main concerns of the Queensland Government (Dept of Natural Resources and Water – NRW) was that

water entitlements being held as shares in a co-operative, as opposed to being held by individuals on the Government register, may not be compliant with the requirements under the National Water Initiative with respect to water markets and trading. This matter has national significance with ramifications for the established irrigation corporations throughout Australia if their corporate structure was also deemed to be non compliant. (PV Water 2007)

The National Water Commission responded to a request for clarification as follows.

For the record, the National Water Initiative (NWI) does not contain any specific provision requiring entitlements to be devolved to individual irrigators. As indicated in our previous correspondence with Pioneer Valley irrigators of 15 April 2005, while the NWI is clear about the trading outcomes it seeks, it does not dictate the means of achieving them (PV Water 2007).

The second case of interest in Queensland is the Lockyer Water Users Forum (LWUF) located in the Lockyer Valley west of Brisbane. As a result of negotiations with NRW about the Moreton Water Resource Plan, government agreed to consider self- or ‘co-management’ and indicated that the details of the rules negotiated through a co-management approach would be incorporated into the Moreton Resource Operation Plan (ROP), the next phase of water planning.

...the Department proposes to investigate user-administered approaches to groundwater management for the Lockyer Valley. This collaboration will recognise and include existing irrigator groups such as the Lockyer Water Users Forum....The collaborative approach might lead to a self-management rules framework with an underlying base level of regulatory management. The management and operating rules potentially developed under such a regulatory self-management model could eventually be incorporated into a Moreton resource operations plan (NRM 2005b, p. 35).

Because there was insufficient data on water use in the Lockyer on which to make detailed decisions about allocations under the ROP at this stage, the proposal for co-management was attractive to NRW as it would foster collaboration and allow for adaptive management as information becomes available. Irrigators also recognised that it is in their best interest to have well-managed water resources. The co-

management system, based on informed decision-making, metering and monitoring across the valley, was seen to alleviate concerns of inequity which have been a source of considerable irritation among irrigators. Irrigators also thought it would be more cost-effective if they ran the metering and would allow them control and flexibility over operational aspects of irrigation as reforms were introduced. One aspect of the proposal was to have NRM allocate water to sub-catchment groups with decisions on individual allocations decided within each group – not dissimilar to the Pioneer, except that it involves groundwater. Note that is still at the proposal stage and is dependent on NRW being convinced that co-management will achieve WRP objectives and its commitments under the NWI. Thus it also relies on the ability of the LWUF to convince NRW that it is a legitimate and accountable group (Baldwin 2008a).

The LWUF co-management proposal has been analysed against Ostrom's principles (Baldwin 2008b, Sarker et al, in press). There are two areas where the LWUF proposed co-management concept is consistent with Ostrom's principles but not accepted by government. First, in terms of boundaries, a portion of the Central Lockyer area which is already regulated is to be excluded from the area subject to co-management. Secondly, LWUF proposed owning water meters with an independent auditor to monitor resource conditions and compliance (Ostrom's fourth principle) but NRW however insisted on compliance with its State-wide Metering Policy which mandates government ownership and maintenance of meters and control of monitoring (Baldwin 2008b, p30).

In addition, there has been minimal discussion in relation to proportional equivalence between benefits and costs (the second principle). While metering charges are clear, administration of the co-management system has not been agreed to be funded<sup>3</sup>, neither has volumetric charges for water. As seen in other case studies, all such entities levy fees to at least support administration (Baldwin 2008b p30).

### **North and South Burdekin Water Boards**

The North and South Burdekin Water Boards are registered Service Providers under the *Queensland Water Act 2000* as a *Category 2 Water Authority* (s 569). A Water Authority is a body corporate and so may for example enter into contracts; and acquire, hold, deal with and dispose of property. The Boards have formed a joint venture for the purposes of administration, regulatory compliance and licensing but continue to operate separately.

The Government sets the policy framework but the Boards are responsible for setting a broad strategic framework, business targets and operational controls. These must comply with Government requirements and where practicable achieve best business practice.

Each Board comprises seven directors, four directors are elected by ratepayers (landholders), two represent the sugar mills and one is nominated by the Shire Council with the chair elected by the Board. Each director is appointed for a term of 3 years. The Boards tend to meet monthly. The Board members oversee the work of the Boards and make strategic decisions.

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<sup>3</sup> An application for Commonwealth funding which included facilitation of co-management was not accepted.

With the new joint venture arrangements it is proposed that the Board structures will change so that there are 2 members from each of 3 different irrigator groups/mill areas and one from local government with varying terms of appointment (2 for 3 years, 2 for 2 years, and 2 for 1 year) to ensure greater continuity of experience. The rationale for having non-irrigators on the Boards has been that CSR operating the mill is closely involved with cane farm areas and local government invested in Board infrastructure and operations over the years.

## **RESPONSIBILITIES AND TASKS**

In establishing a water authority under the Act, the proposal must nominate and advertise its proposed main functions, land area, works, governance and funding arrangements. There is a call for submissions which must be taken into account by the Chief Executive. A water authority has some flexibility in roles and may also choose to carry out:

- riverine area protection;
- soil erosion control;
- land degradation treatment and prevention; and
- the management of recreational areas on land owned by the authority or under its control.

Generally, the Board has the power under the *Water Act 2000* to:

- make and levy rates and charges
- take land
- employ people; and
- delegate its powers.

Specifically the North Burdekin Water Board states that it endeavours to:

- supply constituents in the Water Board areas with a viable supply of irrigation water;
- maintain effective working relationships with all levels of government;
- encourage the use of open water pumping as a tool for recharge and management of the underground storage as well as maximising production in areas of poor water quality;
- comply with workplace health and safety requirements to provide a safe working environment for employees, contractors and the public;
- ensure that environmental considerations are an integral part of all operating and construction procedures, and of the Board's future planning and day to day decisions; and
- promote a multi-skilled workforce (North Burdekin Water Board 2004).

The Board receives a bulk entitlement from Sunwater of 50-60,000 ML of river water and distributes it to irrigators according to an agreement between the Board and the irrigator. It is understood that the Board does not guarantee supply in terms of either quantity or quality; and in order to maintain equitable supply it may be necessary to restrict licensed pump operation from time to time. The notional allocation may be

reviewed annually, either increased if the Board annual consumption remains below "free flow" entitlement or decreased if the full Board allocation is unavailable from the dam in a particular year. Requests to purchase additional allocation by existing or new users of water are considered on their merits subject to development of a farm plan or equivalent assessment, justifying the need for additional allocation. All costs including farm plans and holding charges on allocation not used etc are at the licensee's expense (North Burdekin Water Board 2006).

All new open water installations are to be charged a one off licence fee, which is to offset the cost of the purchase and installation of a suitable meter. The meter remains the property and responsibility of the Board. There is almost no metering of groundwater extraction however the Department of Natural Resources monitors the level of the aquifer as well as the water quality on a monthly basis.

The Act imposes requirements on the Board with respect to certain standards of service and reporting obligations to the regulator, such as:

- preparing strategic asset management plans (SAMP)
- preparing customer service standards (CSS)
- preparing system leakage management plans and
- preparing drought management plans.

The Boards had a fair input into the Burdekin Water Resource Plan (*Water Resource (Burdekin Basin) Plan 2007*), approved on 2 August 2007 which sought to set a sustainable share of the water resources of the whole Burdekin catchment (not including groundwater) between existing and proposed development and the environment. From the Board's perspective the document was generally positive. The Board's allocation was retained while water harvesting rights were extended to 50,000 ML/annum between the North Burdekin Water Board and the South Burdekin Water Board. The Board supported the concept that riparian licensees had prior rights to water, however disagreed with a proposal that all of these licensees would be supplied by Sunwater. The conversion was proposed to be made at 8 ML/ha giving the licensees a private tradeable allocation separate from the Board's allocation. There were concerns about the possibility of allocation being able to be traded outside the Board area which could result in a significant reduction of water available to manage the system. The net effect would be to inhibit the Boards' ability to manage the aquifer within safe limits. This potential impact was the Board's major concern with the Draft Plan (North Burdekin Water Board 2006). The intention to prepare a draft ROP was announced in August 2006. Meters will be required on bores once the ROP comes into effect for the purposes of measuring volumetric use and aquifer management.

Groundwater was not included at this stage of water planning as there was insufficient detailed hydrologic and water use data. A further phase of water planning will include groundwater. The Burdekin Delta Groundwater Model will be used to develop the Groundwater Plan for the Burdekin Delta aquifer. The Board sought ratepayer support for Board-sponsored research projects which will require metering of some groundwater pumps to test effectiveness of meters and more accurately define and manage the impact of irrigation activities on the aquifer (North Burdekin Water Board 2006).

## FUNDING ARRANGEMENTS

The two Boards were constituted to manage the irrigation scheme with capital and operational costs being recouped from sugar growers and millers. As a Category 2 Water Authority, under the Queensland *Water Act 2000* (s572, pt 2, 4, 5), the Boards may levy charges on its customers or ratepayers. It may be levied 'on a volumetric basis for water activities carried out ... and if the authority has an authority area, on a property basis for land in the authority area.'

In the case of the North Burdekin Board, it relies heavily on levies to support its operations. Cane is charged on the base of assessable area, unless a grower can satisfactorily prove that no crop of any kind was grown on that land at any time during the financial year. Other crops are charged on area of crop grown. For the 06/07 year the full area rate was set at \$102 per hectare. For cane, the rate is split between grower (2/3 ie \$68/ha) and the CSR mill (1/3 ie \$34/ha). For other crops: for 06/07 the rate was \$102/ha. Cane levies of \$2.6M from grower and miller contributions consisted of 77% of the total income of \$3.4M collected by the board.

Irrigation charges for all open water users in 06/07 were \$4.80/ML, measured by flow meters. This rate is reviewed on an annual basis. Open Water Licence Fees (Incl. GST) for 06/07 up to and including a 6" pump = \$2,200.00. For 06/07 the fee for an 8" pump = \$4,400.00. An announced allocation, which is to be the trigger point for charging, is made in February of each year, prior to budget. For 06/07 this figure was 8ML/ha. There was no charge for Open Water—Riparian usage up to the 8ML/ha announced allocation but there is an additional charge for over-allocation/excess usage for both Open Water Channels and Riparian users.

The Board also allocated water for domestic and industrial use. The Burdekin Shire Council urban water usage is calculated annually and charged accordingly at the end of the financial year, on receipt of Council's metered bore readings. For 06/07 the Burdekin Shire Council's allocation was 5,000ML; with an annual fixed charge of \$10.64/ ML (GST free) for usage up to and including the 5,000 ML.

The Board also hires out equipment such as elevators, trucks, tractors or performs services such photocopies, FOI and survey requests.

Net fair value of infrastructure and other assets as at 1st July 2006 were \$18.4M. During the last 14 years to 2006, the Board completed a \$6.8 M expansion and upgrade program (North Burdekin Water Board 2006). The Board reported an in-kind contribution of \$57,633 made towards environmental improvement works: construction of a fish ladder and removing floating mats of vegetation and infrastructure debris from a lagoon.

Similarly, the South Burdekin Board reported that it operates on a user-pays cost recovery basis with principal revenue derived from the sugar industry by way of assessable area charges and miller contribution equivalent to one-third of each landholder's annual assessable area charge. It reports that it spends \$1M annually to replenish and manage the aquifer. It is currently reviewing the state of its infrastructure (South Burdekin Water Board 2008).

During the 2005/2006 financial year, the South Burdekin Water Board invested \$60,000 into research and development about:

- geology with major implications for modelling of groundwater flow in the irrigation region, whether for groundwater resource estimation, artificial recharge calculation or managing salt water intrusion.
- a Review of Current Groundwater Monitoring

The two Boards were successful in sourcing \$500,000 of national funding toward the development of irrigation modernisation plans which will trial different efficient irrigation and improve fish passages.

## **PARTICIPATION AND COMMUNICATION**

The North Burdekin Board stated that clear communication of the Board's purpose and function is an essential part of managing the Water Reform process. As Resource Operating Licences, Resource Operating Plans and ultimately the Groundwater Plan for the Board area are developed, it will be critical that the board's resource management responsibilities are recognized (North Burdekin Water Board 2006).

## **LINKAGES**

The Boards acknowledge the importance of close co-operation with ratepayers, local government, government agencies and the wider community, as well as CSIRO's scientific contribution re salinity studies and its link with the Burdekin Dry Tropics NRM Board re potential support for monitoring of the salt-freshwater interface; water quality, and salinity in aquifers.

## **HUMAN RESOURCES AND CAPACITY**

The NBWB has 11 staff members and South Burdekin 7 staff with roles in management, channel and pump site maintenance, with a lesser amount of time spent on aquifer and water quality management.

## **OUTCOMES**

The Board supports this model of an irrigator owned and run irrigation company as members can make their own decisions and 'manage their destiny'. The elected Board members understand the system. They have paid for their infrastructure (along with subsidies) but being a State government statutory authority they can run it on their own and do not pay tax. While they own their assets, it was suggested that if there are problems the government can step in and help.

There were mixed views about the pros and cons of having non-irrigators on the Board. On one hand, CSR representative brings corporate governance expertise and has a vested interest in ensuring farmers receive ongoing supply of water. On the other hand, it was suggested that CSR is seeking to open up more land for cane to ensure mill viability, but this might not be the best NRM solution in certain areas.

It was suggested that there are risks associated with a cooperative which pays tax and would take entire responsibility financially so would need well-trained directors and good rules. Responsibility for upkeep of assets will rest with growers.

It was reported that the Boards have a good working relationship with NRW and CSIRO, with the manager sitting on the Northern Irrigation Futures Committee.

External stakeholders queried whether the Boards were adequately managing the resource and commented that they effectively kept government intervention at arm's

length. The Boards worked well over the past 50 years, but it was suggested that they need to introduce meters to understand the system, be more targeted in recharge, and introduce better water efficiency (ie irrigating cane in sandy soils by furrow irrigation may not be the most resource efficient). Water quality is declining and extraction rates need to be more closely managed particularly in certain areas. It was suggested that government should provide underlying principles and criteria or benchmarks to ensure competent system management. This needs to be supported by an appropriate local skills base.

## REFERENCES

- Baldwin, C. 2008b. Rules for the Magic Pudding: Managing Lockyer Groundwater. *Social Alternatives* 27 (3):27-31.
- . 2008a. Integrating Values and Interests in Water Planning using a Consensus-building Approach. PhD, Natural and Rural Systems Management, University of Queensland, Brisbane.
- North Burdekin Water Board (2004). Policy Statement. Ayr, North Burdekin Water Board.
- North Burdekin Water Board (2006). 41st Annual Report 2005/2006. Ayr, North Burdekin Water Board.
- PV Water. 2008. *Circular 28 May 2007 2007* [cited 12 Oct 2008]. Available from <http://www.pvwater.com.au/doccirc20070528.html>.
- . 2008. *Pioneer Valley Water Co-operative Ltd Newsletter June 2008 2008* [cited 12 Oct 2008]. Available from [http://www.pvwater.com.au/\\_news20080601.pdf](http://www.pvwater.com.au/_news20080601.pdf).
- Sarker, A, C Baldwin, and H Ross. in press. Managing Groundwater as a Common-Pool Resource in Australia. *Water Policy*
- South Burdekin Water Board (2008). About the South Burdekin Water Board. Home Hill, South Burdekin Water Board.
- Interviews: CEO Boards, CSIRO, and NRW officers

## Legislation

Qld *Water Act 2000*

<http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WaterA00.pdf>

Qld *Water Resource (Burdekin Basin) Plan 2007*

<http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WaterReBuBP07.pdf>

## WINNALEAH IRRIGATION SCHEME LTD, TASMANIA

### BOUNDARY DEFINITION

The area covered was essentially defined by land able to be commanded by piped gravity supply from the dam as determined when the scheme was constructed by the government in the early 1970s. It is a proclaimed Irrigation District under the *Water Management Act 1999*. The total area is approx 5000 ha but only about 1300 ha is currently irrigated using water supplied under the scheme, with an additional 1000 ha irrigated by self supply from farm dams/rivers and creeks within the irrigation district.



**Figure 4: Location map of Winnaleah Irrigation District**

### HISTORY AND CHARACTER

Winnaleah Irrigation District was established in 1972 when local farmers negotiated with the Tasmanian Government to make the water from the Cascade Dam (a disused mining dam, constructed in 1934) available for irrigation. The Government agreed to a scheme that would service around 60 properties in the Derby/Winnaleah area of North Eastern Tasmania. In 2003 the Tasmanian government handed over operation of the scheme to an entity established by the irrigators – the Winnaleah Irrigation Scheme Ltd (WIS).

Water is drawn through a pipeline directly from the Cascade Dam on the Cascade River and distributed by gravity through about 35 km of pipeline to the properties in the scheme. The capacity for supply of water under pressure to good quality irrigable land using gravity rather than pumping was what made the scheme attractive.

## PURPOSE

The WIS operates primarily for the purpose of efficiently supplying water to irrigators. It is also obligated to supply water to two small towns and some 200 properties for domestic purposes.

The WIS has also taken on the role of working with government to expand water supply to the area to enable further irrigation development.

## GOVERNANCE ARRANGEMENTS

### Tasmania generally

The Department of Primary Industry and Water administers the *Water Management Act 1999* on behalf of the Minister. The Act allows a body to apply to be a 'responsible water entity' for the purpose of either:

- administration of a water management plan (s 3 and 38) or
- administration of a water district (s 3 and Part 9).

Administration of a water management plan means the body can be delegated any such of the Department's functions in relation to such matters as operational water sharing from a river or aquifer (covering self supply and bulk supply extractors), monitoring and reporting, management of licensing. 'Water districts' come in various kinds, including hydro-electric schemes, urban water supply schemes and irrigation water supply schemes. Administration of a water district normally involves the maintenance and operation of the infrastructure.

A responsible water entity (RWE) can be delegated any of the Minister's powers under the Act that are felt to be necessary and appropriate. This is a very powerful tool for enabling water user self management arrangements. RWEs can impose fees to recover costs. Water entities can include state and local government authorities, corporate bodies under the Federal Corporations Act, cooperatives under state Cooperatives Act, and Trusts established under the *Water Management Act* (s 3).

In considering an application for a body to be a responsible water entity for a water management plan or water district, the Minister has to be satisfied that the appointment will 'further the objectives of the Act' (s 38, 176). In practice this means that the body must be capable of undertaking the work and have a management structure that is financially and socially viable (see information required to be provided with application s 37 and 171).

The Act allows for the creation and continuation of Trusts which are legal entities and are eligible to be RWEs. Trusts appear to be similar in nature to companies limited by guarantee except that instead of its rules for operation being set out in a constitution which can be altered by vote of members, its rules for operation are set out in legislation and the Minister has a greater role in directing its affairs.

While Tasmania has a range of types of RWEs appointed to manage various kinds of water districts (irrigation, hydro, urban/domestic water supply etc), there has not as yet been an RWE appointed to implement a water management plan.

Historically privately developed irrigation schemes were administered by Trusts (eg Clyde Trust established mid 1800s) and government developed schemes were administered by the Rivers and Water Supply Commission. Recently (2002, 2003) the

government has transferred the administration of two of the Commission operated scheme to irrigators under self management arrangements (Cressy-Longford and Winnaleah). The irrigator groups chose a corporation limited by guarantee rather than a trust for their entity structure, and the government was in full agreement with this approach.

### **Winnaleah Irrigation Scheme Ltd**

WIS is a company limited by guarantee, incorporated under the *Corporations Act 2001* and registered with the Australian Securities and Investments Commission (ASIC). As a company it is a legal entity capable of owning property, suing and being sued.

WIS has been established so that, through its constitution:

- it is for non-profit purposes only. Its income can only be applied to promoting those purposes
- members of the company are only liable for their \$10 holding in the company
- the company cannot make distributions to its members and pay fees to its directors.

The primary difference between this and a cooperative is that a cooperative can make a profit and can distribute profits to members. Otherwise it is similar in that members have equal voting rights. This model was chosen based on advice from an accountant for these reasons:

- taxation advantages of a non-profit organisation
- limited liability and capability of owning property afforded by being a company
- voting rights of members
- ability to attract government contributions for capital investment because there can be no windfall capital gain to irrigators.

The option of establishing a statutory trust was not chosen because it was considered by the irrigators to be a less flexible arrangement than a company limited by guarantee. A Rivers and Water Supply Commission (RWSC) officer indicated that they preferred the company over the Trust because company law requirements on directors provided greater transparency and protection to the irrigators than a Trust.

WIS was appointed the RWE for the Winnaleah Irrigation Scheme in 2003, taking over from the RWSC. This arrangement continues under a 5 year rolling agreement. The government has retained ownership of the major assets (dam and main pipelines) and leases them to WIS. WIS is required to maintain them to the satisfaction of government, which is administered through an annual asset plan made by WIS and approved by the RWSC. The government retains the option of reverting the scheme to government control should WIS fail in meeting its obligations under the agreement.

Membership of WIS consists of all the irrigators in the district except one who chose not to be (37 in total). The irrigator who is not a member is still supplied water as a customer, but has not voting rights or involvement in the management of the company.

WIS is governed by a board of 6 elected by and from the members. Members voting rights are 1 vote for those with up to 50 ML of water right, 2 votes for 51-100 ML and

three votes for 101 or more ML. The board then selects three of its members as the Chairman, Managing Director and Treasurer, who together constitute the executive. Operational decisions within the bounds of the constitution are made by the board by vote. The board meets as needed but is currently meeting monthly because of the range of development activities being undertaken (see discussion later).

WIS has the ability to impose fees to recover costs. Where a water user fails to pay, or breaches other conditions of use WIS can cut off supply to irrigators but must resort to other means for domestic users.

## **RESPONSIBILITIES AND TASKS**

The primary obligation of WIS, pursuant to the *Irrigation Clauses Act 1973*, is to supply water to some 200 domestic users (up to 2ML/yr each), two small towns and 38 irrigators over 60 properties. WIS holds a bulk water licence, and irrigators within the scheme have individual volumetric water rights (total 3250 ML/year) which, subject to availability and supply of higher priority uses, the scheme operator is obligated to supply. Where bulk water availability is restricted, WIS distributes that water to irrigators in proportion to their rights, after providing for domestic and town water requirements. WIS maintains the infrastructure necessary to do this including pipelines and meters at properties.

As an appointed RWE WIS has delegated powers of entry for the purpose of constructing and maintaining works and reading meters, subject to various standard conditions relating to reasonability and provision of notice to landholders. WIS is obligated to ensure that the storage in the dam does not drop below a minimum of 200ML for water quality purposes, and is obligated to ensure minimum releases from the dam into the river for in-stream environmental purposes.

Operationally WIS aims to ensure water users receive their water at a pressure within a target range. Where demand peaks affect this, WIS staff seek first to negotiate with water users to spread demand and if necessary will impose rostering.

While it cannot pass on dividends to members, WIS instead aims to minimise fees and provide excellent service. The WIS board has been very proactive in developing measures to achieve these ends. Three projects illustrate this:

- WIS negotiated with a private company to install a small hydro-electric plant on its pipeline. In return for allowing its installation and operation WIS has a 5% stake in the plant, which increases in proportion to annual volumes of water put through the generator in excess of 10,000 ML. The profits returned to WIS are used to offset costs.
- WIS is currently working with the state government to increase water supply to the scheme. Under negotiation at the moment is a proposal to construct works to allow access to another disused dam (Frome Dam) for the purpose of expanding irrigation within the district. Funding for the works will come from WIS and from the government, with exact proportions still to be finalised.
- WIS is in process of upgrading metering and installing remote monitoring of meters through the district.

While development of a water management plan is currently on hold in the local (Ringarooma) catchment, the board plans and expects to have a significant role in contributing to the development of the plan as a major stakeholder.

WIS is required to prepare annual financial accounts, and an annual report to government on compliance with its obligations as a RWE. These are not publicly available however. It is also required to monitor and report on water quality in the dam.

## **FUNDING ARRANGEMENTS**

The annual turnover of WIS is approx \$250,000. Income is derived from charges to irrigators of \$47/ML delivered, and domestic only customers have a flat fee of \$110/year (last years fee scales). The board reviews these fees annually. WIS charges for this year will increase to \$50/ML for allocation water, \$70/ML for excess water<sup>4</sup> and \$140 for a 2ML stock and domestic supply.

This is to recover costs associated with installation of a telemetry metering system and to begin a greater differentiation between allocation and excess to ensure they get "take up" of water allocations as they develop more storage.

In addition the board can approach its members for additional funds to contribute to specific projects such as the proposed addition of another water supply dam to the system. WIS also derives a small income from the hydro generator which will increase over time.

WIS employs a full time overseer to operate the system and undertake basic maintenance, and engages secretarial and accounting support through an accounting firm for \$25,000 per year. Other costs include general maintenance expenses and annual contributions to a sinking fund to provide for asset replacement and refurbishment as needed.

Board members get \$500/year, the Treasurer an additional \$1,000, the Managing Director an additional \$4,000 and Chair and additional \$3,000. Board members do not get any "bonus" distribution of profits.

RWSC charges WIS on behalf of the Crown to cover cost of management of the Crown assets (principally Cascade Dam). WIS take on part of this responsibility as per the 5 year rolling agreement. WIS is guided by an asset management plan and report performance to the RWSC board annually.

WIS notes that they have not had to resort to debt collection for any unpaid accounts. Irrigators are reminded that their payment performance directly impacts on WIS ability to control the cost of water. Communication of this kind has been found to be effective.

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<sup>4</sup> Excess water is water above the base allocation. Base allocations are the portion of water allocated to an irrigator from the dam storage. This has a very high surety as the dam fills consistently. Excess is achieved by catching flows during the irrigation season. This water is managed in different ways depending on the season, i.e.; unlimited access in wet years, but normally a percentage of base allocation in dry years. The base allocation must be paid for whether it is used or not (unless it is transferred to another irrigator).

## **PARTICIPATORY ROLES AND REQUIREMENTS**

Membership of WIS consists of all the irrigators in the district except one who chose not to be (37 in total). The board routinely communicates with members through a bi-monthly newsletter.

While in theory a vote of members is only required for change of constitution, in practice the board calls meetings and votes whenever it considers that a decision is significantly non-routine to warrant it. There is an annual general meeting for the purpose of electing the board members and other general business.

## **LINKAGES**

The board has a close working arrangement with the Rivers and Water Supply Commission, who are described as being generally supportive. The board is required to prepare and submit to the Commission an annual operating plan for approval.

## **HUMAN RESOURCES AND CAPACITY**

New board members, being elected from the membership, are required to do the short course for company directors to ensure they understand their duties. As mentioned above, the WIS employs a full time overseer to operate the system and undertake basic maintenance, and engages secretarial and local accounting support through a local accounting company for operational accounting support and appropriate keeping of minutes and other record keeping and reporting obligations under the Corporations legislation (\$25,000 per year).

## **OUTCOMES**

The WIS board believes they have been very successful in providing efficient operation of the system for the benefit of the water users. They have succeeded in keeping fees down to \$50/ML, compared to a forecast fee of \$100/ML by the Rivers and Water Supply Commission had it continued operation of the scheme. A government agency officer indicated that they are very happy with WIS and would recommend the governance model for similar circumstances elsewhere. WIS has so far been a responsible manager of the assets, has given irrigators an effective voice and has collaborated well with government.

From this sound basis WIS plans to continue proactively working with the government and private enterprise to expand water supply and improve service (eg the hydro generator, the proposed additional dam and the proposed enhancement of metering).

## **REFERENCES**

DPIW website [www.dpiw.tas.gov.au](http://www.dpiw.tas.gov.au) for general information on the scheme.

Interviews: Managing Director, WIS. Also representative of Tasmania Rivers and Water Supply Commission, which is responsible for regulatory supervision of WIS in its role as a Responsible Water Entity.

## **Legislation**

Commonwealth *Corporations Act 2001*

[http://www.austlii.edu.au/au/legis/cth/consol\\_act/ca2001172/](http://www.austlii.edu.au/au/legis/cth/consol_act/ca2001172/)

*Tas Irrigation Clauses Act 1973*

[http://www.austlii.edu.au/au/legis/tas/consol\\_act/ica1973204/](http://www.austlii.edu.au/au/legis/tas/consol_act/ica1973204/)

*Tas Water Management Act 1999*

[http://www.austlii.edu.au/au/legis/tas/consol\\_act/wma1999166/](http://www.austlii.edu.au/au/legis/tas/consol_act/wma1999166/)

# WEST CORURGAN PRIVATE IRRIGATION BOARD, NSW

## BOUNDARY DEFINITION

West Corugan Private Irrigation Board (WCPID) serves 250 properties on 212,000 ha in the West Corugan Private Irrigation District in the Southern Riverina of NSW between the Murray River and Billabong Creek (figure 5).

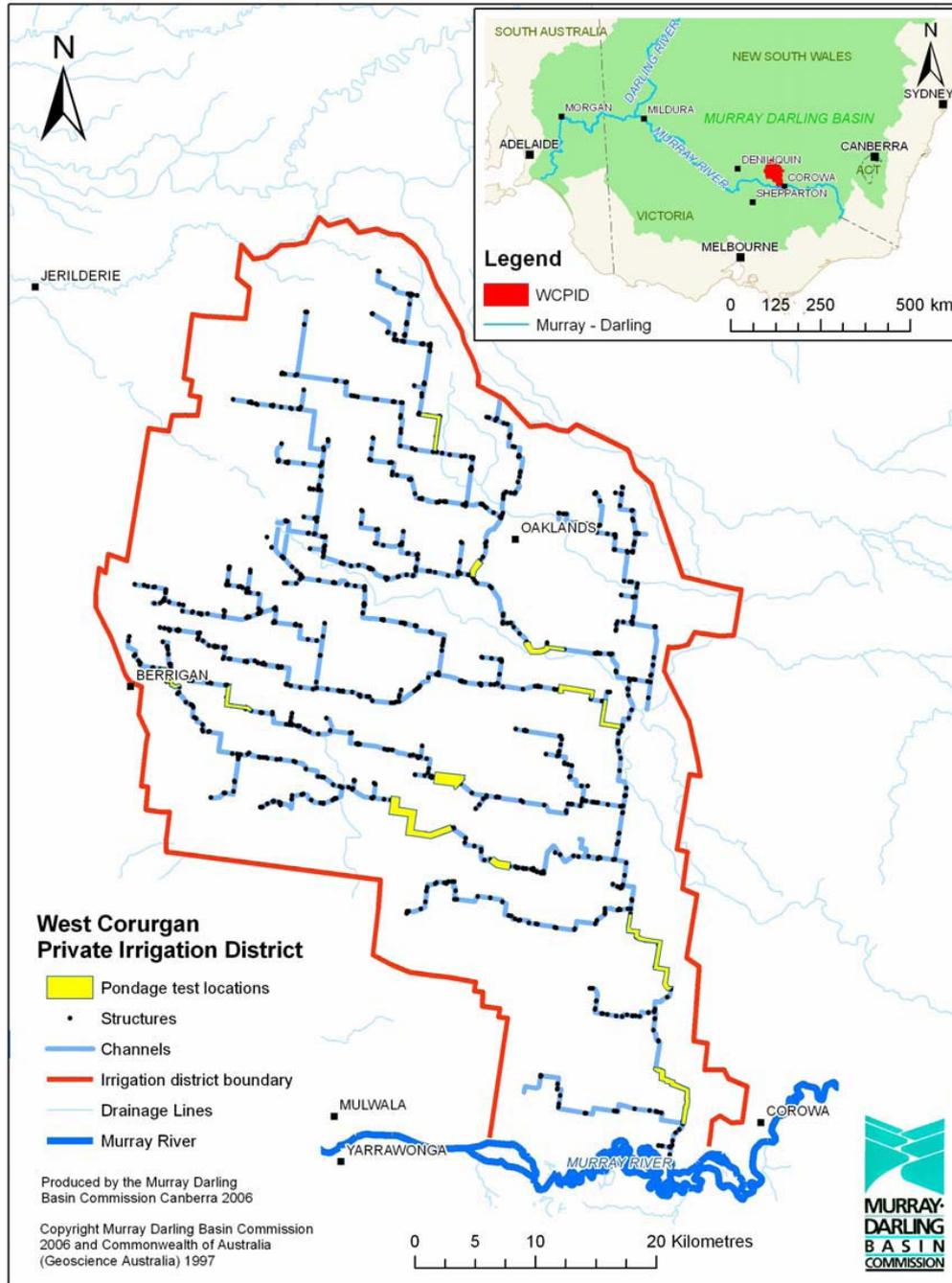


Figure 5: West Corugan Private Irrigation District

The boundaries of the Private Irrigation District (PID) were established by the location of the first irrigators to join the scheme in 1969, and there have only been minor changes since due to water transfer limitations. Within the boundaries, the number of irrigators has dropped in recent years from 300 to 250, with “neighbours buying neighbours”.

WCPIB has the pumping ability to extract a maximum of 686 ML daily from the River. In 2006, it had a 80,092 ML General Security License and a 736 ML High Security License, of which it used 57,409 ML.

## HISTORY AND CHARACTER

Private irrigation boards are totally private in origin. They arise from applications by groups of landholders to create a private irrigation district under the Act. Such applications are considered by the Minister and if granted the district and the board are created by proclamation of the governor. Private irrigation districts continue to be created even now. Once proclaimed the governance arrangements of the board are in accordance with the Act and regulations, and as such are not easily altered. These include board elections and procedures, rates and charges, finances and accounts. The Board has statutory powers under the Act in relation to the entry on land to construct or maintain works, read meters or conduct investigations in relation to the supply of water as set out in the plans associated with the proclamation of the district.<sup>5</sup>

In 1968 the West Corugan Committee (as it was known then) lobbied for an allocation from the Murray so they, as a group, could build their own irrigation district, which was then opened in 1969 by the Minister for Water. This was a bulk water allocation to the group, not to individual farmers.

In 1973 the Committee was successful in lobbying to have it recognized as the first PID in NSW, with its own autonomy, and it is now recognised under the *NSW Water Management Act 2000* as a statutory authority (1976). It has legal status as a corporation. The West Corugan Board of Management Water Rights By-Law 1980 recognised the Board as the sole licensee, meaning that farmers can only trade water internally and those exiting the scheme must return their water share to the Board (at a negotiated price). The Board then reallocates the share.

There has been little change in the entity or its operations over time. However, drought has impacted significantly for the last 3 years and has led to zero allocations for the last 2 years.

In addition to the drought, the key issues WCPIB have been facing are:

- the ACCC’s proposal to have individual water entitlements listed, as WCPIB believe it is entirely contrary to the purpose of a PID to provide a secure

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<sup>5</sup> In contrast, NSW Irrigation Corporations were created when former government irrigation districts were privatised. Each is a private entity (either a company or a cooperative) with internal governance arrangements set out in a constitution, which can be altered by the vote of membership and subject only to complying with the general requirements of the federal *Corporations Act* or *NSW Cooperatives Act* as appropriate. The *NSW Water Management Act 2000* includes a schedule of these Irrigation Corporations (which cannot be added to). Subject to an operating licence, these listed Corporations are given specific powers under the Act in relation to the entry on land to construct or maintain works, read meters or conduct investigations in relation to the supply of water and drainage service in their designated area of operations.

community structure. West Corugan believe ACCC's proposal will remove their customer base, as farmers will not be an integral part of the scheme (NB this is the common issue being faced by all of the private irrigation entities in the southern Murray-Darling connected system, where climate change is drastically reducing forecast future water availability, the federal government is buying back water licences for the environment and COAG is driving freeing up of water trading into and out of irrigation districts).

- significant increases in government bulk water prices.

## **PURPOSE**

West Corugan Board's mission, as stated on their website, is:

To manage the West Corugan Private Irrigation District to the satisfaction of the Corugan landholders in the most equitable, economically viable, efficient, environmentally sound and productive manner possible.

## **GOVERNANCE ARRANGEMENTS**

### **NSW generally**

The Department of Water and Energy administers the *Water Management Act 2000* on behalf of the Minister. The Act allows any person to hold a water licence, and any landholder to construct and operate works to take and distribute water from a water source, subject to obtaining an approval from DWE.

The Act provides for delegation of some powers (eg to enter, construct, impose fees, etc) to 5 specifically listed Irrigation Corporations; and Private Irrigation Boards, Water Authorities and Trusts created under the Act. It does not expressly provide the ability to delegate powers to other organisations such as privately established incorporated associations or companies. The Act includes a general power of delegation but it has not been exercised to give powers to other entities, and it is uncertain whether it can be effectively used for this purpose.

The government provides no support nor has any involvement in the internal operations of private irrigation boards. Government agencies are concerned only that the bulk water taken is within the allocations provided to the scheme as a whole.

### **West Corugan Private Irrigation Board**

WCPIB was initially set up as a virtual cooperative. However, the members soon realised they needed regulatory powers to run it well so they copied the South Australian legislation and worked with government to put in place the NSW *Private Irrigation Districts Act 1973*. (This was subsumed by the *Water Management Act* in 2000 (see ch 4 part 2)). They wanted to be able to manage individual irrigators and to run it as an independent or self-help community-based scheme, but at the same time retain enough flexibility to be able to adapt to community needs and set their own operating rules. They consider that the PIB structure enabled them to distribute water flexibly to encourage development in the early days and then later according to the "real needs" of irrigators. The manager calls this, "socialization" of water. Since the introduction of water trading this no longer occurs.

Under the *NSW Water Management Act 2000*, a PIB manages the affairs of the irrigation district on behalf of all landholders in the district. It builds infrastructure, operates the scheme, supplies water and levies and recovers rates and charges.

Under the Act a Board is to be elected every 3 years by landowners in the PID. The WCPIB has a board of 10 elected on a zonal basis, with 2 Board members per zone, and it meets monthly.

When the PIB was initially established, irrigators' share of the Board's bulk water licence was established according to the contribution to the original infrastructure. However, since the early days, depending on the percentage announced by government as being available, an allocation is made to irrigators, which is a multiple of that percentage and the irrigator's government-determined entitlement to water rights.

PID rules do not permit trading outside the scheme for individual irrigators.

In May each year, WCPIB staff develop the annual budget based on the figures of the previous year and these are then discussed and announced by the Board in July. While members are kept informed, there is not a high degree of participation, with about 10-15% irrigators regularly talking to their zonal Board member or the administration. The only scheme-wide meeting held is the AGM. No Special Meetings have been called by the membership.

WCPIB issues regular monthly newsletters and monthly water accounts, and publishes some information on its website.

Any disputes arising are resolved in discussions between the irrigator and the relevant Board member.

The only change in governance that has been discussed is the question of whether to keep or scrap zonal representation by the Board. At the current time no decision has been made on this.

## **RESPONSIBILITIES AND TASKS**

Private irrigation boards are legal entities which hold bulk water licences. Irrigators within the District have volumetric allocations which the Board is obligated to supply (subject to water availability). It also has an obligation to supply stock and domestic water to properties within the District.

Construction, operation and maintenance, and water supply and setting prices and penalties are statutory responsibilities of the PIB.

Prior to the drought when the WCPIB held a water reserve, the Board would also informally make its own internal adjustment of around 10% more than the government allocation and share some of the reserve water as well. As there is currently zero allocation, this is not current practice.

West Corugan believes that irrigators are also environmental caretakers, and as only 10% of the district area is irrigated the scheme is seen to be environmentally sustainable in the long term.

Several years ago it also developed a Land and Water Management Plan with NHT funding. However, due to lack of funding, the plan is not currently being implemented.

WCPIB has also participated in the Living Murray Program to try to improve irrigation infrastructure efficiency through addressing seepage and unaccounted losses, but it proved too expensive at the time. In addition, while there was funding from the Department of Agriculture, waterwise training days for irrigators were also held.

Currently West Corugan is awaiting the outcome of an application for federal government funding for the preparation of a modernisation plan targeting irrigation efficiency.

WCPIB do not generally measure water quality or quantity, apart from that taken from the river and supplied to irrigators. As the river water quality is good, they only monitor quality when there is a known pollutant event such as blue green algae. There is no aquifer use because of poor water quality.

Temporary and permanent water trading is facilitated by the PIB. Currently there is no new water available and under the Act, external trading is not permitted as the water belongs to the PIB. Only water carried over from last year is currently available, plus domestic supplies.

Penalty fees can be levied by the PIB FOR pollution, water stealing, or interfering with infrastructure.

The PIB has a statutory responsibility to provide an annual financial audit report to the NSW Department of Water and Energy. While they also relate to State Water in for bulk extraction from the river (water ordering etc) there is no reporting required.

Government plays little role in the operations of the PIB. However, it can remove Board members and appoint an Administrator, wind it up, take over works and require a copy of audited accounts.

## **FUNDING ARRANGEMENTS**

The Board can levy members to pay for its services. This year's budget is approximately \$2.3M and as always, is totally funded by irrigator members' fixed access fees and consumption charges.

The biggest component of spending is labour (28%), with 24% spent on water, about 32% spent on operation and maintenance of plant and channels, and administration costs at 6%.

Pricing is calculated by averaging last year's costs and estimating a break-even point for recovery of costs, with the only charges being levied being fixed and consumption charges. While prices have remained the same for the last 2 years, the recent AGM saw significant pressure from irrigators to reduce charges further, perhaps through savings from staff reductions.

## **HUMAN RESOURCES AND CAPACITY**

The PIB currently has 7 staff and turnover is very low. When recruiting, it looks for multi-skilled workers who can fill a variety of roles and it sets its own employment conditions.

Consultants are used when WCPIB needs to make major decisions, for example when they participated in the Living Murray research regarding the cost-effectiveness of water efficiency measures.

## OUTCOMES

While there have been many events West Corugan have had to face such as drought, government charges, water trading legislation, and increasing regulation, WCPIB believes that there has been no need for major changes in the way the PIB runs its operations. The security that the Act gives, as well as the ability to be flexible to meet community needs (the “socialization” of water, rather than its commodification) are seen as major benefits of this way of operation.

In terms of operations government agency staff consider that WCPIB has been a clear success. Currently several of the older NSW water trusts are in process of converting themselves into PIDs with Boards like WCPIB, as it is a proven successful model.

However they are concerned with the constraints that this arrangement places on the ability of individuals to permanently trade their water allocations out of the scheme. As the Board holds the water licences, agencies always have to go through the Board to get to deal with individuals, and the Board is generally opposed to trade out of the District.

In the southern connected Murray Darling open trade is a basic tenet of the NWI. As a policy measure it is seen as essential to allow water entitlement holders to adjust to reduced future water availability generally. Additionally the Federal government is seeking open access to all irrigators in its \$3.1b water entitlement buyback scheme. Other entities such as the larger NSW irrigation corporations, who are under pressure to free up trade out, point to WCPIB and other similar entities suggesting that the same should apply to them also.

Farmers in West Corugan say they are resigned to no irrigation this year but they need enough domestic water to have some “green” around the house. So WCPIB has organised tanker deliveries to meet this need.

Water reform is seen by WCPIB as the biggest challenge in the future. However, the PIB does not have the resources of a more major corporation to influence water reform and believes it will have to rely on peak bodies to lobby for their common interests.

## REFERENCES

Interviews: Manager WCPIB. Also a recently retired water agency officer who dealt with WCPIB for many years.

WCPIB website [www.corugan.com.au](http://www.corugan.com.au) for general information on the scheme

WCPIB. *Submission to Water Market Rules Position Paper* (ACCC), 15 August, 2008

[www.accc.gov.au/content/item.phtml?itemId=827347&nodeId=b5712ece38b54af0eb9626620a7e68b4&fn=sub%2...](http://www.accc.gov.au/content/item.phtml?itemId=827347&nodeId=b5712ece38b54af0eb9626620a7e68b4&fn=sub%2...)

WCPIB. *Summarised Financial Report 2007/2008*. (Copy available from Manager.)

## Legislation

*NSW Water Management Act 2000*

[http://www.austlii.edu.au/au/legis/nsw/consol\\_act/wma2000166/](http://www.austlii.edu.au/au/legis/nsw/consol_act/wma2000166/)

*NSW Private Irrigation Districts Act 1973 (repealed)*

Not available on line, but essential elements were subsumed into the *Water Management Act 2000* ch 4 part 2 (see above link).

## FIRST MILDURA IRRIGATION TRUST, VIC

### BOUNDARY DEFINITION

First Mildura Irrigation Trust (FMIT) irrigates approximately 6750 hectares out of 7610, using 39,759 ML of Murray River water for 1200 customers (largely irrigators, some stock and domestic), on recent figures.

### HISTORY AND CHARACTER

FMIT was constituted by an act of parliament in 1887 to take over the supply of Murray water originally established by the Chaffey Brothers, so as to guarantee water to the irrigators in the area. FMIT has recently been taken over by Lower Murray Water (a government owned entity). The following information is based on the FMIT prior to the takeover.

The takeover by Lower Murray Water has been controversial and was opposed by many FMIT members. According to FMIT information, other issues with which FMIT has been grappling include:

- Drought and concerns over water allocations and threat to viability of irrigators
- Poor commodity prices
- Lack of detail in proposed takeover of Murray Darling Basin by Federal Government and the threat of another layer of bureaucracy and reporting
- South Mildura Rehabilitation Project
- Unbundling of entitlements into Water Register
- A new Managing Director.

### PURPOSE

FMIT's stated purpose is:

To deliver irrigation and drainage services to our customers that are cost effective, providing the opportunity to improve on farm wealth, achieving water efficiencies leading to environmental health, and building on the vision of the Chaffey brothers for the Sunraysia Region.

FMIT provides untreated water for irrigation and garden use only and focuses on customer needs, being debt free and on future planning and budgeting. It also provides drainage services for most of its irrigation landholders.

### GOVERNANCE ARRANGEMENTS

#### Victoria generally

Victoria's water management under the *Water Act 1989* is jointly administered by the Department of Sustainability and Environment (DSE) and water authorities (rural and urban). DSE has the central role of planning, setting policy and bulk entitlements to water authorities. The water authorities have the operational role covering water supply infrastructure maintenance and operation, licensing, and raising of fees and charges.

Apart from FMIT there are three rural water authorities covering all of Victoria. Many years ago the various irrigation districts across the state were consolidated under the administration of these authorities. While FMIT is also rural water authority under the Act, it is peculiar in that its size is small. It is (or now was) the last of the irrigation districts not to be subsumed by the larger authorities.

Apart from these authorities, Victoria does not have any other rural water entities with any kind of statutory powers. Licence to take water can however be applied for and held by any legal entity, including associations, cooperatives and companies, or by multiple persons acting jointly. This means there are many cases in Victoria similar to the NSW Abercrombie Pumping Association, where Victorian water authorities have nothing whatsoever to do with their internal operations.

### **First Mildura Irrigation Trust**

FMIT is a water authority under the *Water Act 1989* and its governance arrangements are prescribed under that Act. It has a Board of six elected by irrigators in FMIT area every 3 years. Landholders of irrigable land greater than 1ha, supplied water by FMIT infrastructure, are entitled to be registered as voters. Board members must also be registered voters themselves.

Plans are developed via a review of their Environmental and Water Savings Infrastructure Master Plan and their Future Directions Strategy. In recent times the drought has forced the Board to take a more reactive approach and to delay and defer planning. FMIT says it disagrees with the recent audit which found it has ‘immature management processes’.

Major decisions are made via the ballot at irrigator meetings. Irrigators are kept informed through 2 meetings per year (attendance 100-300), quarterly and special edition newsletters, and media releases. FMIT believe that although they do not have a Community Advisory Committee, irrigators are able to take their issues directly to the Board members who make themselves available every week.

FMIT reports that it has the lowest number of complaints of Victorian water authorities as judged by the Energy and Water Ombudsman complaints registry of Victoria – less than 5 per annum since inception. It claims that the Essential Services Commission also highly regards FMIT’s customer engagement and customer satisfaction.

FMIT has a Customer Code of Conduct which outlines customers’ rights and responsibilities and details a formal complaints resolution process. It takes a cooperative approach to debt collection.

FMIT has had significant involvement with conservation organisations, supporting revegetation and providing additional environmental water in addition to supporting reuse of its drainage water by the local council.

FMIT’s website and annual reports fully detail its arrangements.

### **RESPONSIBILITIES AND TASKS**

FMIT holds a bulk water entitlement and landholders supplied by it have ‘water shares’ within the bulk entitlement.

A major role of the FMIT has been to support irrigators through the drought. This is considered an important task in managing the short, medium and long term viability

of FMIT. Another major task is seen as reductions in water use (3600 ML since 1999 with another proposed another 2000 per year).

FMIT monitors water use through manually reading meters. All properties are metered and, although these have been paid for by irrigators, they are owned by FMIT.

FMIT approves trade of water shares (permanent trade) and seasonal water allocations (temporary trade) into, out of and within the District. FMIT reports that there was a net permanent trade out of its district of 1609 ML and net temporary trade out of 10,601 ML. They report that permanent water shares were reduced by only 2% in 2006-7, compared to much greater permanent trades in other Murray water authorities.

FMIT reports to the Victorian Government under *Water Act 1989* re:

- The operation, maintenance, renewal and management of water supply infrastructure and associated systems within their designated districts;
- The provision of quality cost effective services which achieve full cost recovery on a renewals accounting basis; and
- The establishment of effective interface with customers for the various water services supplied and for the FMIT's community service and environmental management obligations.

FMIT sees the need to review its currently time-consuming monthly reporting processes.

## **FUNDING ARRANGEMENTS**

FMIT indicated that it has not received any government funding, and that major projects have been funded solely by FMIT and its customers (irrigators). In 2007-8 they also received \$1.6M in rate relief from the government.

FMIT has undertaken significant borrowings but has acknowledged non-compliance with the *Borrowing and Investment Powers Act 1987* when it made some poor investment choices in recent years. Borrowings were not from a Treasury-approved fund. It claims confusion about its powers when moving from borrowing under the Victorian *Water Act 1989* to borrowing as a Declared Authority under the BIP Act.

FMIT recovers costs from its irrigators (though the recent Deloitte audit report has challenged FMIT's management of this).

FMIT levies 11 different charges including, for 2007-8:

- Customer Charge \$167.00
- Service Point Charge \$146.00
- Auxiliary supply \$110/ connection
- Bulk Water Charge \$ 6.17/ML
- Water share fee \$8.43 per water share
- Delivery capacity share for Mildura South \$522 per maximum ML in a 14 day period
- Delivery Capacity Share for other areas, \$436 as per above

- Metered Use Charge \$42.55/ML
- High pressure levy \$35.46/ML
- Excess water penalty \$2000/ ML
- Drainage Fee \$6.04/ ML of annual use limit

These prices are an average 23% increase on the previous year and were approved unanimously by irrigators. A separate charge for electricity used in pumping has been absorbed into other charges above.

In 2008-9 it is proposed to change the pricing structure to include a higher ratio of fixed to variable costs.

FMIT does not have a full accounts payable system as it believes it is too expensive to implement.

### **HUMAN RESOURCES AND CAPACITY**

FMIT generally makes its own decisions internally. However, it acknowledges that good business acumen is important and that they may have suffered from less than satisfactory skills in some personnel. There were previously concerns held by irrigators about management, but following a change of personnel, these issues were resolved.

FMIT has used consultants on a number of occasions - when it was preparing its 2009-2013 Water Plan for the Essential Services Commission, to assess water system losses in 2007-8 and when it undertook a risk management plan in 2003.

Key Performance Indicators (KPIs) are being developed for executive staff and 6 monthly performance reviews are proposed. FMIT has an Enterprise Agreement with staff, totalling 28.

FMIT staff have received training in recent times in asset management and have moved to improve their policies and procedures. It sees asset management software as being expensive and has moved cautiously to upgrade IT capabilities in this area. However this was achieved during 2007-8. This area of management has presented significant difficulties for FMIT.

### **OUTCOMES**

FMIT claim that prior to the takeover, they were the only independent water authority in Victoria and that as the Board was a vocal one, this may have led to the Department of Sustainability and the Environment wishing to exercise more control.

Becoming a Declared Authority has also caused major confusion about borrowing powers, leading to non-compliance. As a Declared Authority under Victorian legislation FMIT became subject to financial options and requirements that are in common with other statutory authorities in Victoria, rather than the previous requirements that were established through the *Water Act 1989*. Also the ongoing adverse conditions (drought, reduced water allocations, water deliveries and customer affordability) have meant FMIT has had to continually adapt and change its plans.

A recent financial audit by Deloitte found the 'FMIT was not viable in the long term as its small size made it vulnerable to the effects of reduced rainfall, leading to reduced allocations, and therefore revenue'. The Essential Services Commission and the Deloitte review also found FMIT was not compliant with several clauses in their

Statement of Obligation with regard to ‘management of risks to its assets, measures to deal with emergencies or incidents, and plans, systems and processes to manage its assets’ (press release August 15, 2008). These are areas of responsibility under its Statement of Obligations under the Victorian Water Act, and in which FMIT has been trying to improve its performance. FMIT claims none of its customers were interviewed during the review, and they strenuously deny the conclusion of bad decisions made by FMIT Directors and management.

The Minister for Water stated the takeover was due to poor financial management by FMIT and that ‘a takeover of FMIT’s assets and business functions will protect the interests of local growers and ... make it a larger and more diverse organisation better able to manage cash flow, assets and risk’ (15 August 2008). However, FMIT irrigators fiercely resisted this. Lower Murray Water has subsequently announced that it aims to provide ‘a seamless transition including water supply to the customers within the FMIT district so that they can continue to operate and use the water that is available to them’ (Lower Murray Water, 2008).

FMIT believes its small size and irrigator empathy and “family business” style was important to irrigators, and that the government takeover will wipe that out. It is also concerned about the ownership of its assets and will be taking that matter to court.

## REFERENCES

FMIT website <http://www.fmit.com.au/>

Lower Murray Water. 2008 Media Release: Lower Murray Water Statement on the FMIT Transfer of Functions, 20.08.08  
<http://www.lmw.vic.gov.au/documents/MediaReleaseFMITLMWIntegration200808.pdf> cited 4.09.08

Victorian Ministry of Water. Press release August 15, 2008

Interviews with FMIT staff

## Legislation

*Vic Borrowing and Investment Powers Act 1987*

[http://www.austlii.edu.au/au/legis/vic/consol\\_act/baipa1987370/](http://www.austlii.edu.au/au/legis/vic/consol_act/baipa1987370/)

*Vic Water Act 1989*

[http://www.austlii.edu.au/au/legis/vic/consol\\_act/wa198983/](http://www.austlii.edu.au/au/legis/vic/consol_act/wa198983/)

## REFERENCES

- ASIC. 2008. *General information on companies limited by guarantee 2008* [cited 26 Aug 2008]. Available from [www.asic.gov.au](http://www.asic.gov.au).
- AUCD. 2008. *Incorporated associations 2008* [cited 26 Aug 2008]. Available from <http://www.aucd.org.au/howto/nfp/#03-01>.
- CoA. 2004. Intergovernmental Agreement on a National Water Initiative between the Commonwealth of Australia, and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory. Canberra: Commonwealth of Australia.
- DOCEP WA. 2008. *Associations Guide 2008* [cited 26 Aug 2008]. Available from <http://www.docep.wa.gov.au/associationsguide/>.
- FT NSW. 26 Aug. *Cooperatives and associations*. Fair Trading NSW 2008 [cited 2008 26 Aug]. Available from [http://www.fairtrading.nsw.gov.au/Cooperatives\\_and\\_associations/Associations.html](http://www.fairtrading.nsw.gov.au/Cooperatives_and_associations/Associations.html).
- GoWA. 2005. Government response to the report of the Irrigation Review Steering Committee Final Report. Perth: Government of Western Australia.
- . 2005. State Water Strategy - Irrigation Review Final Report. Perth: Government of Western Australia.
- . 2007. Western Australia's Implementation Plan for the National Water Initiative. Perth: Government of Western Australia, Dept of Water.
- . 2008. Request for Quote 038-2008: Interjurisdictional analysis of community based governance arrangements for water resource management. Perth: WA Dept of Water.
- Marsden Jacob Associates. 2004. Future Governance of the NSW Abalone Fishery: Alternative Arrangements.: NSW Fisheries and the Abalone Development Company.
- Ostrom, E. 1992. *Crafting Institutions for Self-Governing Irrigation Systems*. California: ICS Press.
- . 2005. *Understanding Institutional Diversity*. New Jersey: Princeton University Press.
- . 2007. A diagnostic approach for going beyond panaceas. *PNAS* 104 (39):15181-15187.
- Ostrom, E, J Berger, C Field, R Norgaard, and D Policansky. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284:278-282.
- Ostrom, E, and H Nagendra. 2007. Tenure alone is not sufficient: monitoring is essential. *Environmental Economics and Policy Studies* 8 (3):178-199.
- Ross, A, and P Martinez-Santos. 2008. *The challenge of collaborative groundwater governance: four case studies from Spain and Australia* [cited 12 October 2008 2008]. Available from <http://www.newater.uos.de/caiwa/data/papers%20session/F4/ARPMSCAIWA.pdf>.
- WA WRIC. 2006. A Blueprint for Water Reform in Western Australia: Final advice to the Western Australian Government. Perth: WA Water Reform Implementation Committee.

———. 2006. Water Reform Program Directions Paper: Increase Self Management.  
Perth: WA Water Reform Implementation Committee, Dept of Water.