



Water Rights Arrangements in Australia and Overseas

Annex D *Queensland*

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Citation of this annex should read:

Productivity Commission 2003, *Water Rights Arrangements in Australia and Overseas: Annex D, Queensland*, Commission Research Paper, Productivity Commission, Melbourne.

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Abbreviations

CMA	Catchment management association
CRP	Community reference panel
DBBRC	Dumaresq–Barwon Border Rivers Commission
EPA	Environment Protection Agency
EPA 1994	Environment Protection Act 1994
EPP 1997	Environmental Protection (Water) Policy 1997
ERA	Environmentally relevant activity
IPA 1997	Integrated Planning Act 1997
IROL	Interim resource operating licence
GL	Gigalitres
NCC	National Competition Council
LCMC	Landcare and Catchment Management Council
LWMP	Land and water management plan
NR&M	Department of Natural Resources and Mines
QCA	Queensland Competition Authority
ROL	Resource operating licence
ROP	Resource operations plan
WA 2000	Water Act 2000
WRP	Water resources plan
WUP	Water use plan

Preface

Water Rights Arrangements in Australia and Overseas is a study that forms part of the Commission's program of benchmarking the performance of economic infrastructure industries. It continues previous work undertaken into the arrangements for setting drinking water quality standards. The study compares the legal, organisational and regulatory arrangements for managing water rights, against accepted best practice principles.

This annex is one of twelve case studies prepared to assist readers understand the complex legal, organisational and management arrangements of the jurisdictions studied. Case studies were prepared for the Murray–Darling Basin, NSW, Victoria, Queensland, South Australia, the ACT, the Colorado River Basin, California, Colorado, Chile, Mexico and South Africa.

Research for the study and each of the annexes was undertaken by the Economic Infrastructure Branch, with Dr Neil Byron as mentoring Commissioner.

The Productivity Commission would like to thank especially the staff of the Queensland Department of Natural Resources and Mines for feedback on information contained in this study. Further feedback from readers would also be welcome.

1 The water sector

Queensland, in the north-east of Australia, occupies an area of 1.7million square kilometres and over 32 large catchments (EPA 1999). The state has several climates. To the north and east of the state, the climate is subtropical. During the 2001–02 summer season, the long-term rainfall average in the Peninsular North was 897 mm. In contrast, the climate is semi-arid to the south and west of the state. The long-term rainfall average was 116 mm in the Far South-West (NR&M 2002a).

The majority of surface water resources in Queensland are in the northern catchments where approximately 76 per cent of the state’s rainfall drains to the Gulf of Carpentaria and the Coral Sea (EPA 1999). However, the majority of Queensland’s 3.7 million population, and therefore water use, is located to the south and east of the state.

Water users in Queensland derive 75 per cent of their total water supply from surface water. The majority (70 per cent) is obtained from coastal systems. The remaining supply is groundwater, drawn primarily from the Great Artesian Basin (NCC 2001). The Great Artesian Basin underlies 65 per cent of the state and is often the sole source of water for stock and domestic use in the far west of the state (EPA 1999).

The major categories of water use are: irrigation (65 per cent); domestic urban (17 per cent); stock and domestic (14 per cent); industry (3 per cent); and power generation (1 per cent).

As at June 2000, there were over 53 major water storage facilities. These facilities held over 5210 Gigalitres (GL) of water, 75 per cent of which was classified usable (NR&M 2000a).¹

¹ Unusable storage is the volume of water stored below the level of the outlet works or pumps or in isolated upstream waterholes. Usable storage is the volume stored exclusive of unusable storage.

2 Legal framework

Queensland water law was originally based on the English common law riparian doctrine. This doctrine was extinguished in 1910 when the state exercised its right to water and licensed the access and use of water.

Water licences were originally allocated on a ‘first-come first-served’ basis. However, increased competition for scarce resources, and the recognition of environmental cost associated with poor river health, led to the introduction of a strategic, consultative approach to water management on a catchment and basin-wide basis (Boughton undated).

2.1 Evolution of water law

Queensland water law has evolved since 1910, with successive revisions of its water legislation: the *Rights in Conservation and Utilisation of Water Act 1910* (the ‘1910 Act’); the *Water Act 1926* (the ‘1926 Act’); the *Water Resources Act 1989* (the ‘1989 Act’); and the current *Water Act 2000* (WA 2000).

State control of water — through vesting provisions in law — began with the 1910 Act. The 1910 Act vested the rights for water in watercourses and lakes in the state (Parker and Hinrichsen 2000). The 1910 Act applied to both surface and groundwater. It also provided for the establishment of Bore Water Supply Areas and Boards, which sought to control the extraction of artesian water (Boughton undated).

Under the 1910 Act, water users were required to obtain a licence to take water. Licences were for periods of between two and ten years and there was no statutory right of renewal. Licences were subject to cancellation, amendment or alteration at any time. Licence holders had no right to be compensated for the removal or change of a licence. In addition, the state was not required to consider environmental consequences of water use when issuing licences (Parker and Hinrichsen 2000).

The 1926 Act shared many features with the 1910 Act and extended the government’s control to regulate groundwater (Boughton undated).

Under the 1989 Act, the Crown was similarly vested with the right to the use, flow and control of certain waters, such as, the water of a stream that flowed through or past more than one private property, or flowed in certain ‘declared areas’. The state did not have any rights to water or power to control overland flows.²

As with earlier legislation, licences were issued under the 1989 Act on a ‘first-come first-served’ basis. Licences authorised the operation of a water work (pump, bore or weir). The licensing body was not required to consider the reliability of supply of existing water licence holders when issuing new licences. Licences could not be sold separately from land. This meant that in fully allocated systems, additional water could only be purchased through the acquisition of land (Parker and Hinrichsen 2000).

As with earlier legislation, the state had the power to change or cancel licences without compensating licence holders. Infrastructure operators could also change or cancel supply contracts with water users, without compensation, thereby limiting the exercise of licences. In addition, the 1989 Act made no allowance for the allocation of water for the environment.

During the 1990s, the state introduced legislative and policy reforms to manage water resources in a sustainable manner. These were aimed at recognising environmental values and establishing clearly defined, enforceable and transferable entitlements to water.

2.2 Current legislative framework

The current legislative framework includes: the *Water Act 2000* (WA 2000) (which gives the government the power to allocate water and protect the environment); the *Integrated Planning Act 1997* (IPA 1997) (which provides the government power to approve water works); and the *Environmental Protection (Water) Policy 1997* (EPP 1997) (which provides a policy framework to address environmental issues not considered by the WA 2000). In addition, there are several interstate agreements influencing the allocation of water.

² Water flowing over land (such as from flood, rainfall or spring) but not yet in a defined watercourse or lake.

Water Act 2000

Under the WA 2000, all rights to the use, flow and control of all water in Queensland are vested in the state.³

One of the purposes of the WA 2000 is to:

advance sustainable management and efficient use of water and other resources by establishing a system for the planning, allocation and use of water (WA 2000, s. 10).

Under the WA 2000, the state manages water resources by:

- planning the allocation of water — through water resource plans (WRPs) and resource operations plans (ROPs);
- administering entitlements for the access to water — by issuing water allocations, licences and permits; and
- administering licenses to operate water infrastructure — by issuing resource operating licences.

Though water quality is normally addressed by the Environment Protection Agency (EPA), the WA 2000 does provide for the water quality of environmental flows to be addressed by WRPs.

Resource planning

The WA 2000 authorises the government (through the Department of Natural Resources and Mines or NR&M) to plan the allocation of water between the environment and other uses. This is achieved through the preparation of variety of planning instruments (WRPs and ROPs), and licensing arrangements such as ROLs.

NR&M prepares a WRP for each catchment (or management area). The WRP defines the environmental and security objectives for that area. The WRP includes performance indicators and monitoring requirements. WRPs are subordinate legislation. WRPs are effective for 10 years once approved by the Governor-in-Council — unless a new plan is prepared and approved as a result of a review (see figure 2.1).

Once a WRP is prepared, NR&M then prepares a ROP for that catchment. The ROP provides the operational framework for implementing the WRP, and includes the operational rules for particular parts of a catchment (see figure 2.1). A ROP has an

³ Water is defined as water in watercourse, lake or spring, underground water, overland flow water, and water collected in a dam (WA 2000, s. 19).

indefinite life-span. However, it must be amended to reflect any changes resulting a review of a WRP.⁴

A ROP can include trading rules, where trading is providing in a management area. For example, in some instances existing licences in areas of a WRP with low levels of water demand and low environmental impacts have not been converted into tradeable water allocations by the ROP.

*Licences, contracts and entitlements*⁵

NR&M can grant resource operating licences (ROLs) and interim resource operating licences (IROLs) for the operation of water related infrastructure (weirs, dams and flumes) that impact upon natural flows or groundwater resources — conditional on meeting the requirements of a WRP. These licences provide the rules operators of water infrastructure assets must follow when distributing water to users and the environment. The operating rules of ROLs are consistent with the objectives of the overarching WRP (see figure 2.1).

All holders of water allocations in supplemented rivers are required to enter into supply contracts with the ROL holder.⁶ Supply contracts typically define the obligations of both the ROL holder and the water entitlement holder. For example, ROL holders are required to supply water, and water allocation holders may be required to meter water use and to pay for the delivery of water. Supply contracts will typically include default and termination conditions, and can also set out the procedures by which water entitlement holders can transfer water allocations on a temporary basis.

Under the WA 2000, individuals may only take or interfere with water if they obtain an entitlement from NR&M — except where statutory rights have been defined or in emergency situations.⁷ Water entitlements include: water allocations; interim water allocations; and water licences. The WA 2000 also permits other taking of water, but subject to specific circumstances.

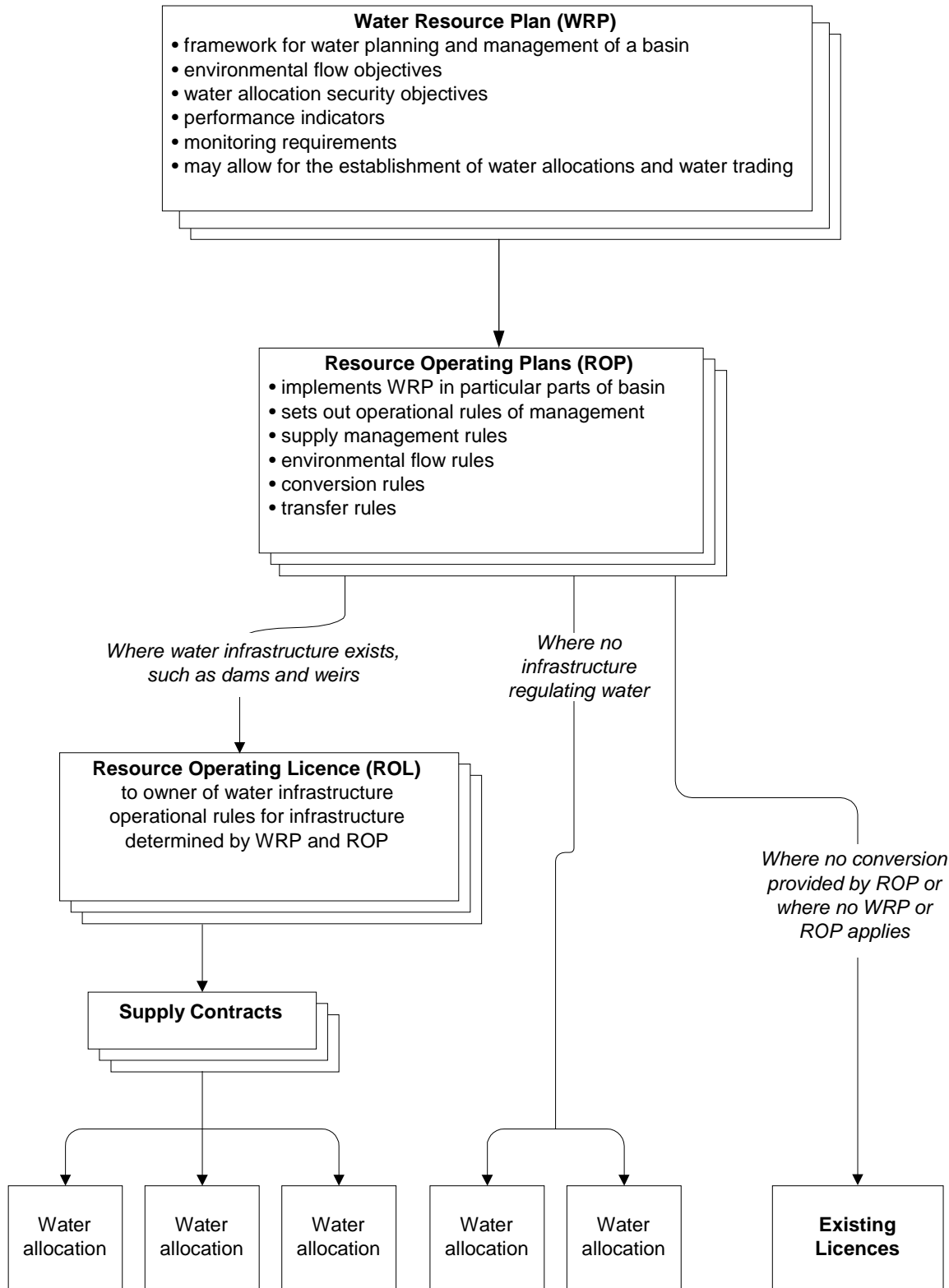
⁴ The WA 2000 makes provision for a ROP to be amended if required to allow for progressive implementation of trading in a WRP area.

⁵ Although the generic term ‘water rights’ is used throughout this series of reports, for Queensland this should not be misconstrued as implying any proprietary rights. In Queensland, the interests are licences, permits, allocations and entitlements.

⁶ A supplemented stream is one whose flow is supplemented by water from a storage facility.

⁷ Some statutory rights do exist such as the right for water to be taken for camping or for watering stock. Water may also be taken without an entitlement for an emergency such as a bushfire.

Figure 2.1 Resource planning under *Water Act 2000*



Source: *Water Act 2000*, Queensland legislation Bulletin No 9/00

The WA 2000 provides guidelines for the granting, changing, transferring and forfeiture of entitlements. It also provides a mechanism by which water allocation, licence and permit holders can seek a review, appeal or seek arbitration of decisions of NR&M.

Integrated Planning Act 1997

The IPA 1997 provides an approval process for the construction of water-related infrastructure works (such as dams, pumps and weirs). The purpose of the IPA 1997 is to achieve ecological sustainability by:

- coordinating and integrating planning at the local, regional and state levels;
- managing the process by which development occurs; and
- managing the effects of development on the environment (including managing the use of premises).

The IPA 1997 defines ecological sustainability to be the integration of:

- protection of ecological processes and natural systems at local, regional, state and wider levels;
- economic development; and
- maintenance of the cultural, economic, physical and social wellbeing of people and communities.

Works are approved through the Integrated Development Approval System (IDAS), provided within the IPA 1997. Under the Act, applications are made to NR&M for approval to construct the relevant water works (IPA 1997, s. 3.1.7). Applications are open to public comment or objections from third parties (IPA 1997, s. 3.2.7 and 3.2.8). NR&M may refer the application to other agencies as required (IPA 1997, s. 3.3.1).

NR&M may require the application to be accompanied by an environmental impact assessment (IPA 1997, s. 3.5.5). Generally, the NR&M will approve an application if the proposed water work does not compromise the desired environmental outcomes in the relevant WRP area (IPA 1997, s. 3.5.14).

Environmental Protection (Water) Policy 1997

Whereas the WA 2000 addresses issues of water quality (at least they it relates to environmental flows), water quality issues are mainly addressed in the EPP 1997.

The policy is subordinate legislation to the *Environmental Protection Act 1994* (EPA 1994) and applies to all Queensland waters (EPP 1997, s. 4).

The EPP 1997 provides a process for setting and formalising water quality objectives for a specific waterway — in accordance with the National Water Quality Management Strategy. This includes developing and implementing local government stormwater, sewage and trade waste, and water conservation plans.

The EPP 1997 is guided by the objectives of the EPA 1994. The latter seeks to protect the environment through the principle of ecologically sustainable development (EPP 1997, s. 3). The EPP 1997 provides a framework for:

- identifying environmental values;⁸
- deciding water quality guidelines and objectives to enhance the environmental values;
- making decisions to promote efficient use of resources and best practice environmental management; and
- involving the community through consultation and education and promoting community responsibility (EPP 1997, s. 6).

The EPP 1997 also provides for the development and implementation of environmental plans for water, including plans for managing stormwater, sewage, trade waste, water conservation and for protecting the quality of surface and groundwaters.

Water quality is mainly addressed through the licensing of point source discharges. These licences apply to activities that have been defined as environmentally relevant activities (ERAs). Under the EPA 1994, any person engaged in an ERA must be licensed. Consequently, many industries are required to obtain a licence in order to discharge waste-water to waterways (EPA 2002). As of June 2002, no irrigation activities have been listed as ERAs.

Inter-governmental agreements

Queensland is party to three major inter-governmental agreements directly affecting access to water. These are: the New South Wales Queensland Border Rivers

⁸ Environmental values are defined by the policy as a list of qualities including suitability of the water for recreational use, agricultural use, industrial use or for supply as drinking water. If the water has not been subject to human interference, values relate to the biological integrity of a pristine aquatic ecosystem. If the waters have been subject to human interference the values relate to the biological integrity of a modified aquatic ecosystem. Environmental values are described in EPP 1997 (s. 7).

Agreement (1946); the Murray–Darling Basin Agreement (1992); and the Lake Eyre Basin Intergovernmental Agreement (2000).

In 1946, NSW and Queensland entered into the NSW–Queensland Border Rivers Agreement. The agreement governs the sharing of water from the Border Rivers — the Severn, Dumaresq, Macintyre and Barwon, and sets out guidelines for the appointment, constitution and powers of the Dumaresq–Barwon Border Rivers Commission (DBBRC). In Queensland, the agreement is ratified under the *New South Wales–Queensland Border Rivers Act 1946*.

The *Murray Darling Basin Act 1996* ratifies the Murray–Darling Basin Agreement (1992). The purpose of this agreement is to promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray–Darling Basin.

The Lake Eyre Basin Intergovernmental Agreement (2000) — between the Commonwealth, Queensland and South Australian governments — was established to eliminate adverse cross-border impacts in relation to shared water resources in the Lake Eyre Basin. The agreement relates to the Thomson–Barcoo–Cooper, Georgina, and Diamantina river systems. In Queensland, the agreement is ratified by the *Lake Eyre Basin Agreement Act 2001*.

Queensland is a party to a number of international agreements that have both direct and indirect impacts upon water entitlements. These include the Ramsar Convention on Wetlands of International Importance (1971) and the Draft International Covenant on Environment and Development (1995).

3 Organisations

The organisation mostly responsible for managing Queensland's water resources is NR&M, where it undertakes the resource planning, administration, monitoring and enforcement functions.

A number of other agencies have advisory roles in the administration of water allocations and water licences. These include the Landcare and Catchment Management Council (LCMC) and catchment management groups.

The Queensland Environmental Protection Agency (EPA) is responsible for environmental protection, including maintaining and improving water quality. However, the agency has no direct role in the allocation of water resources or in the regulation of return flows from irrigation.

The bulk of water service provision occurs through SunWater (a state government-owned corporation), SEQWater and local government authorities. SunWater supplies nearly 50 per cent of all water consumed in Queensland, including around 40 per cent of the state's irrigation water (NCC 2001). The largest 18 of the 125 local authorities account for 80 per cent of water connections.

3.1 Department of Natural Resources and Mines

NR&M is responsible for managing the state's land, water, mineral, petroleum and vegetation resources. NR&M objectives and strategies include:

- advancing the stewardship of natural resources through the encouragement of sustainable natural resource management practices and the facilitation of environmental best practice outcomes;
- providing the framework and institutions for efficient and safe use of natural resources, including the provision of local planning and management frameworks, and a resource entitlements regime; and
- providing essential information and knowledge through the management of economic, social, scientific and ecological information resources (NR&M 2002b).

NR&M's roles are to:

- prepare state policies on managing river and groundwater systems;
- develop, review and assess WRPs;
- develop ROPs, establish water allocations, and specify water sharing rules, environmental management and infrastructure operating rules and monitoring practices;
- manage the preparation of regional water supply plans;
- prepare riverine management plans, including plans for overall ecosystem health;
- monitor and assesses water resources and their related ecosystems;
- provide guidelines for water allocation holders and directions for water license holders in those catchments outside of areas governed by WRPs;
- audit the status and effectiveness of allocation policies; and
- monitor the compliance of water entitlement holders.

The guidelines for groundwater protection are established in the EPP 1997. The policy requires the development and implementation of environmental plans regarding the protection of groundwaters. NR&M is the lead agency in implementing these plans.

NR&M is responsible to the Queensland Parliament through the Minister for Natural Resources and the Minister for Mines.

3.2 Environmental Protection Agency

The EPA is the state's principal agency for environmental protection and incorporates the former Queensland Parks and Wildlife Service.

The EPA is responsible for regulating activities to improve water quality — with the exception of drinking water. The EPA conducts ecological assessments of all major water infrastructure projects that require environmental impact assessments. In addition, the EPA is responsible for ensuring that proposed development is consistent with the environmental requirements of the EPA 1994.

The EPA is responsible to the Queensland Parliament through the Minister for the Environment. The EPA has a number of reporting requirements, including quarterly reports to the Queensland Treasury, as required by the state's financial framework,

and through monthly performance reports to its executive. The EPA is also required to annually report on its performance during the preceding financial year.

3.3 Dumaresq–Barwon Border Rivers Commission

The NSW and Queensland DBBRC oversees the water sharing arrangements in the Border Rivers area. The DBBRC determines the volume of water that may be used by each state annually, in accordance with the provisions of the agreement. In addition to the distribution and use of surface water, the agreement provides guidelines for the operation and maintenance of works and the financial arrangements of the DBBRC (Green 2001).

3.4 Landcare and Catchment Management Council

The LCMC provides community advice to the Minister for Natural Resources on landcare and catchment management policy in Queensland. The LCMC has an independent chair, a deputy chair, and 21 members appointed by the Minister. Members include representatives of state departments, local governments, indigenous groups, the Queensland Farmers' Federation and the Queensland Conservation Council.

The LCMC does not employ any staff. Financial, executive and administrative support is provided by NR&M.

The LCMCs' terms of reference directs it to develop policies, strategies and guidelines along the principle of sustainable development (Queensland Government 2001). The LCMC coordinates and develops regional resource management strategies, endorses regional boundaries for the management of regional strategy development and project assessment, and endorses regional catchment management strategies.

The LCMC is also responsible for providing advice and strategic direction for the operation, management, administration, monitoring and evaluation of the Natural Heritage Trust.

The LCMC is required to report to the Minister for Environment and Heritage and to the Minister for Natural Resources four times a year, or more frequently at the discretion of the chair. The LCMC must also present an annual report to the Minister of Natural Resources and to the annual conference of landcare and catchment management groups.

3.5 Catchment management associations

Catchment management associations (CMAs) are established under Queensland's Integrated Catchment Management program.⁹ CMAs provide planning, coordination and advisory functions. They also develop strategies to achieve integrated management of natural resources within a river catchment (Queensland Government 1999). In January 2002 there were approximately 32 CMAs.

CMAs are not established under legislation. Consequently, their roles and responsibilities are not specified by legislation or regulation. It has been observed, nonetheless, that CMAs:

foster the development and voluntary implementation of catchment management strategies through existing government and community organisations. While catchment management strategies are not legally binding, they provide guidelines and recommend policies and action plans which people who use and manage resources are encouraged to adopt (Bellamy et al. 2002).

CMAs provide a forum for community input. They are generally comprised of representatives of industry, local government, landcare groups, community groups and state government agencies that are involved in the management of land and water resources.

CMAs have no statutory ability to raise revenue and depend upon NR&M for administrative support, and on the state government for financial support to develop catchment management strategies (Bellamy et al. 2002).

Some CMAs input into the drafting of WRPs and ROPs through representation on community reference panels (CRPs). These bodies advise NR&M on issues affecting such as water quality, sustainable commercial use of river systems, water allocation processes and environmental flows.

3.6 Queensland Competition Authority

The Queensland Competition Authority (QCA) was established by the *Queensland Competition Authority Act 1997*. The QCA is an independent statutory authority consisting of members appointed by the Governor-in-Council.

The QCA is principally concerned with monopoly prices oversight in a number of industries. The QCA investigates the pricing practices of government monopolies or

⁹ Catchment management associations were previously known as catchment coordinating committees.

monitors the prices charged by them. Its role is determined by the terms of reference it receives from the Premier and the Treasurer.

The QCA reports to the Treasurer when performing its functions. However, it is not subject to government direction in relation to the conduct of investigations, reports or access to services (QCA 2002).

3.7 Water suppliers

Water is impounded, stored and distributed to users by mostly public-owned water suppliers (such as SunWater and SEQWater) and municipal water suppliers (such as local governments and water boards).

SunWater

SunWater is the largest infrastructure owner and water supplier in Queensland. SunWater was corporatised on 1 October 2000, and assumed the roles and responsibilities of the former State Water Projects.¹⁰

The SunWater board is accountable to its shareholding Ministers — the Deputy Premier, the Treasurer and Minister for Sport, and the Minister for Natural Resources and Minister for Mines.

SunWater owns bulk water storage and distribution infrastructure and provides water to about 7500 irrigators, industrial customers and urban bulk water customers. It also provides facility management services to other water infrastructure owners, and engineering consultancy services to government and private sector clients (PC 2002).

SunWater is responsible for managing a number of irrigation districts, including Bundaberg, Burdekin–Haughton, Dawson Valley, Nogoa–Mackenzie, St George, Pioneer Valley and South Burdekin.

SunWater's major assets include 81 weirs and barrages, 25 major dams, 72 major pump stations, more than 2500 km of pipeline and open channels and more than 730 km of drainage works. In 2000–01 SunWater employed 526 staff and collected \$74 million in revenue; \$14 million of which came from the government in the form

¹⁰ State Water Projects operated as a commercialised business unit within the former Department of Natural Resources. Eungella Water Pipeline Pty Ltd and North West Queensland Water Pipeline Pty Ltd are wholly-owned subsidiaries of SunWater.

of a community service obligation payment. SunWater also generated \$687 000 from the sale of water allocations.

SunWater holds approximately 768 GL of interim water allocations across its schemes, about 50 per cent of which are allowances for distribution losses. SunWater also held IROLs for 27 water supply schemes in 2000–01. The IROLs provide SunWater with interim water allocations. SunWater holds 29 per cent of the water allocations listed under its IROLs. SunWater also holds water-harvesting licences for the Burdekin–Haughton, Bundaberg and Saint George water supply schemes (SunWater 2001).

SEQWater

SEQWater is the major supplier of untreated water in bulk to local governments and industry in south-east Queensland. SEQWater is a public company owned by the Queensland Government (20 per cent), Brisbane City Council (45 per cent), and eleven other local governments (35 per cent).

Local governments

Local governments, including joint local governments and Aboriginal and Torres Strait Islander community councils, deliver bulk and retail water services to urban and rural ratepayers. Local government authorities are responsible for approximately \$18 billion in water infrastructure assets.

Local government authorities participate in the planning and coordination of WRPs through the collection and supply of information and representation on advisory panels.

Most, local governments retail water purchased from either SunWater, other local governments acting as bulk water suppliers, and water boards (NR&M 1999a).

There are 125 local governments ranging in size from the Brisbane City Council — which supplies more than 300 000 water connections — to local councils with less than 1000 connections (NCC 2001). About 40 per cent of Queensland's local councils service 1000 water connections or less.

Water boards

Water boards are statutory bodies which have been formed to conserve, store and supply water (WA 2000, s. 1083). They provide bulk water to major urban,

industrial and irrigation users. They may also have other functions, including flood prevention, drainage and replenishment or improvement of groundwater supplies.

As owners and operators of infrastructure they may be required to hold ROLs (or IROLs). Urban water boards may also hold water allocations.

The three largest water boards are the Gladstone Area Water Board, the Mount Isa Water Board and the Townsville–Thuringowa Water Supply Joint Board (NQ Water). There are an additional 23 smaller water boards, 17 drainage boards and 4 bore water boards that supply water for stock and domestic use, irrigation and town water in Queensland (NCC 2001).¹¹

¹¹ Drainage boards also manage on-farm drainage networks.

4 Definition of entitlements

There are four entitlements that permit access to Queensland's water resources:¹²

- Stock and domestic entitlements — These are conferred by statute to owners of land adjoining a watercourse for the purpose of extracting water for stock or domestic use.
- Water permits — The Chief Executive of NR&M may grant permits for the taking of water for specific short-term activities (such as to build a road), and for specific locations. Water permits can not be transferred, amended, renewed or suspended. Permits can be cancelled at any time by NR&M (WA 2000, ss. 241–242).
- Water licences — Granted by NR&M, licences permit access to surface and groundwater in areas where a WRP and ROP have not been prepared or in areas where the ROP does not provide for the establishment of water allocations.
- Water allocations — NR&M may grant water allocations for the taking of surface and groundwater in management areas where the ROP provides for their establishment.

4.1 Coverage

A universal system of water rights exists when all potential uses of available water resources are effectively controlled by a water right system. Under the WA 2000, a water allocation is only granted if the catchment (or management area) is declared and subject to the provisions of a WRP and ROP. In non-declared areas, water is allocated through water licences and any guidelines issued by NR&M.

Stock and domestic statutory entitlements permit water to be taken — without requiring registration — by an owner of land adjoining a watercourse, lake, or spring for stock and domestic purposes (WA 2000, s. 20). However, the Minister may limit by regulation the entitlement to draw water for domestic use in specific locations — for example, to prevent rural residential subdivisions. Stock and

¹² Although the generic term 'water rights' is used throughout this series of reports, for Queensland this should not be misconstrued as implying any proprietary rights.

domestic entitlements do not extend to overland flow or groundwater. Landowners are required to obtain works approvals for any works used to divert water.

Water licences can only be used on land that are riparian to a watercourse, lake or spring, where there is an aquifer under any of the land or for overland flow water. Persons seeking to obtain a licence for non-riparian land must obtain a registered lease or easement over the land adjoining the water for the purpose of delivery.

Water licences include irrigation licences and water-harvesting licences. Both types can be issued for supplemented and unsupplemented systems. Water supply agreements (contracts) were also used to ensure that water was provided for urban, industrial and intensive stock uses (NR&M 2000b).

Water allocations apply to surface water (both supplemented and unsupplemented systems), overland flow and groundwater. Water allocations grant access to water from a supplemented watercourse. The water allocation is supplied by a service provider in accordance with a ROL. Groundwater resources may be managed under a service providers' ROL or by a water resource regulator.

4.2 Specification

The WA 2000 requires water licences to be defined in volumetric terms. Water licences are also defined in terms of a priority (such as high, medium or low). Licences under earlier legislation were specified as 'area-based': the amount of water that could be accessed was dependent on the amount necessary to irrigate a defined area of crop.

Area-based licences are being progressively converted to volume and priority based licences (NCC 2001). The conversion rate is defined in the relevant WRP. For example, area-based licences and permits within the Boyne River Basin were converted to volumetric licences at a rate of 4.4ML/hectare (NR&M 2001a). In some catchments, unconverted licences may still be defined as area-based terms.

Water allocations supplied from supplemented and unsupplemented rivers are an entitlement to a share of the allocatable resource. In most cases, water allocations are specified as having a nominal volumetric entitlement and a priority of access. The actual amount of water available to an allocation holder will depend on the actual water available that season for that priority group and the nominal volumetric entitlement of the water allocation.

The priority of a water licence or allocation is defined by the 'security objectives' of the WRP and ROP (see box 4.1).

Box 4.1 Security objectives of the Pioneer Valley Draft Water Resource Plan — 2001

The security objectives of the Pioneer Valley Draft Water Resource Plan state that every water licence and allocation will be defined into one of four priority classes.

1. *High priority class A* — water allocation holders will receive their full entitlement 95 per cent of the time, and the extent to which the entitlement is less than 100 per cent is minimised.
2. *High priority class B* — water allocation holders will receive their full entitlement 95 per cent of the time, and the extent to which their entitlement is less 97 per cent, is minimised.
3. *Medium priority class* — water allocation holders will receive their full entitlement at least 85 per cent of the time, and the extent to which the entitlement is less than 90 per cent is minimised.
4. *Risk priority class* — water allocations will receive their full entitlement at least 0 per cent of the time.

The reliability percentage is defined as the proportion of months during the simulation period during which water allocations were fully supplied.

Source: NR&M (2001b).

Water allocations supplied from unsupplemented rivers also contain diversion conditions. The conditions specify the rate at which the water may be taken and any other conditions, such as flow thresholds, which may apply.

As mentioned earlier, water licences and allocations do not confer a right to construct water works. Construction of works associated with water require a separate works approval under the IPA 1997. Water allocations do not confer a right to be supplied with water by the infrastructure service provider. Supply contracts manage these activities.

Enforceability

Enforceability implies that water rights are secure from involuntary seizure or encroachment. Stock and domestic statutory entitlements can be legally enforced. Water licences and allocations are also enforceable under the WA 2000.

Water licences and allocations are granted by NR&M, and may be amended or cancelled by the Chief Executive of NR&M. If a water licence is inconsistent with a WRP or a ROP, the licence must be amended. Amendments can not adversely affect

the quality and availability of water for other entitlement holders (WA 2000, s. 218).

The terms and conditions of water allocations may be changed in response to changes in a WRP. The owner of an allocation can seek reasonable compensation from the state if a change in a WRP reduces the value of the allocation, and the change occurs within the 10 year life of the WRP. Changes made at the end of the life of the WRP are not subject to compensation.

Holders of water licences and allocations may contest the decisions of the Chief Executive of NR&M through a process of internal review, appeal and arbitration. Water allocations may be forfeited if a holder has been convicted of an offence against the Act (WA 2000, s. 138).

4.3 Record of title

NR&M maintains records of permits, licences and water allocations on issue. For each water licence, NR&M records the period for which the licence is granted, the water to which it relates, the location from which the water may be taken and the land to which the licence is attached.

Water allocations must also be recorded on the Water Allocations Register. The register operates as a module of the Queensland Land Titling System. The register is accessible through the payment of a fee. A person may search the register and obtain a copy of an allocation or a registered instrument. The copy is certified by the registrar to be an accurate copy.

Each entry on the register must state the:

- details of the person who holds and how the person holds the allocation;
- a volume of water for the allocation;
- the location from which the water may be taken;
- the purpose including for example agricultural industrial or urban for which the water may be taken; and
- the ROP under which the water allocation is managed (WA 2000, s. 137).

If the water allocation is sourced from an unsupplemented supply, then the entry must also specify the flow conditions and the maximum rate at which water may be taken. If the water allocation is managed under a ROL or IROL, each entry must also state the priority group to which the licence belongs and the licence number of the ROL or IROL under which it is taken.

The register also records any continuing interest in water allocations. However, unlike under a Torrens Title system, the Queensland Government does not guarantee the validity of titles in the registry, and so ownership of the title can be legally challenged.

4.4 Duration

A water licence is granted for period of between three and 10 years, after which time the licence must be renewed.

Water allocations are ongoing entitlements. However, water allocations are subject to the provisions of the WRP, which is reviewable after 10 years. A water allocation may be amended or cancelled following a review. However, the Barron Basin Draft WRP states that its objective is to ensure a continuation of water allocations beyond the 10 year period of the plan:

While the plan must be replaced after 10 years, it is intended that all water allocations and resource operating licences issued or developed in accordance with the plan will perpetuate — rather than being cancelled and reissued — subject to any redefinition of terms and conditions that may arise from a review (NR&M 2001c, p. 17)

It is expected that through continual monitoring and regular reporting, any necessary adjustments to the WRP that become evident will be addressed and not left until the 10 year review. This is intended to allow water allocation holders some confidence that their allocation will be secure beyond the 10 year plan.

4.5 Exclusivity

Water rights are exclusive if, at the margin, they ensure that the benefits and costs of using water accrue to the right holder.

Third-party effects are controlled through the establishment of environmental flow requirements, controlling for the discharge of water from irrigated land and point sources, and the imposition of conditions and obligations on water allocations.

Environmental flows

In a supplemented system, a storage manager must ensure that the environmental flows of that system conforms to the environmental flow requirements specified in the storage operator's ROL. ROLs may also apply to infrastructure relating to groundwater. Similarly, in unsupplemented systems, NR&M must also ensure that

the environmental flows conform with the environmental flow requirements of that system.

Environmental flow requirements are specific environmental flow targets. They are specified in terms of flow rates, for specific events and for certain times of the year. They may require a storage operator to release water for environmental purposes or to curtail the taking of water by water allocation holders during certain times of the year under certain conditions.

The specification of environmental flow requirements are usually made in accordance with the operating requirements of the ROP and the broad environmental objectives of the WRP.

Return effects

The return of water is controlled by several mechanisms. As mentioned earlier, point source discharges are regulated by the EPA. However, irrigation projects are not deemed to be an ERA for the purposes of the EPA 1994.

Second, given the presence of sleeper and dozer licences, water allocations and licences are issued on the presumption that there will be no return flows. This protects the security of existing entitlements from being eroded as a result of any future activation of sleeper and dozer licences.

Third, non-point land and water degradation is addressed through two statutory planning instruments — water use plans (WUPs) and land and water management plans (LWMPs) (WA 2000, Part 3, Division 3).

WUPs are subordinate legislation, authorising the control of activities that may cause negative effects on land and water resources — including salinity, deteriorating water quality and soil erosion. WUPs are prepared for management areas, and define the objectives and performance standards for the practices of water users (including water use efficiency, water reuse and water quality) and monitoring requirements in the area.

WUPs have a life of 10 years — although there is an allowance for the Minister to amend or replace an existing WUP under certain circumstances (WA 2000, ss. 68–70).

LWMPs are farm-level plans, prepared to address potentially adverse consequences to riparian and stream health from irrigation (WA 2000, s. 73). LWMPs describe how and where water can be applied to the land.

Water allocation and licence holders may be obliged to prepare LWMPs by the contractual arrangements between them and the infrastructure providers, such as SunWater (Dixon 2000). Irrigators are required to have LWMPs where trading in water allocations occurs or where new water allocations are purchased or leased. A LWMP may also be required in an area where a WUP has been prepared (DNR 2000).

LWMPs have a life of 10 years — although they may also be amended within the 10 year life-span.

Obligations

Several broad categories of statutory obligations and liabilities exist for stock and domestic, water licences and water allocations. There is a general prohibition on the taking, supplying or interfering with water unless it is authorised (WA 2000, s. 808). This would constitute an injury to the Crown's right to the use, control and flow of water.

In addition, water may only be taken in the manner authorised. This is usually stipulated through the provision of conditions. The conditions applicable to water licences may include to:

- commence taking water within a stated time;
- meter the volume of water taken;
- take the water authorised under the licence;
- provide and maintain access to alternative water supplies for other water entitlement holders who would be affected by the granting of the licence; and
- carry out and report on a stated monitoring program (WA 2000, s. 214).

The conditions applicable to water allocations are usually specified in the ROP, and may include conditions relating to:

- the maximum volume of water taken in a water year;
- the maximum instantaneous rate at which water may be taken;
- the flow under which the water may be taken; and
- where water can be extracted from an unsupplemented source (NR&M 2002c).

The WA 2000 allows persons who have suffered an injury as a result of an offence to seek compensation for personal injury suffered by the party or for loss or for damage to their property because of the commission of the offence (WA 2000, s. 784).

4.6 Detached from land title and use restrictions

Stock and domestic entitlements and water licences are not legally separable from land (WA 2000, s. 206). Licences are granted to owners of land for the taking of water to use on the land or to interfere with the flow on, under or adjoining any of the land.

Water allocations possess their own deed and may be traded or transferred free of land title. In addition, the WA 2000 does not place any requirement that a water allocation holder be a landowner. In certain circumstances, a water licence can be granted to certain entities that are not landowners.

As mentioned earlier, water allocations and licences are separate from works approval. Under the WA 2000, the approval of works is separated from both water licences and water allocations. Works approvals must be sought through the IPA 1997.

Water licences and allocations can be granted for a certain purpose. As mentioned earlier, water use approvals are managed through WUPs and LWMPs. WUPs and LWMPs are site specific and do not require to be reviewed administratively whenever a water allocation is transferred.

4.7 Divisibility and transferability

An entitlement is divisible when it can be sub-divided into parts so that users can sell either the whole or only part of their entitlement. Transferability refers to the ability to transfer ownership of a right from one water user to another in a voluntary exchange.

Stock and domestic entitlements and water licences have limited divisibility (WA 2000, ss. 213 and 225). A licensee can apply to replace an original licence with two or more new licences. However, the new licences can only attach to the land to which the original licence relates.

Water licences can only be permanently transferred with the land title (WA 2000, s. 222). However, water licences can be temporarily transferred through seasonal water assignments, where allowed by a WRP or ROP (WA 2000, s. 230).

Water allocations are fully divisible. Water allocations may be transferred permanently, leased or transferred temporarily (through seasonal water assignment), separately from land title, if transfers are permitted by the WRP and ROP. Transfers

in supplemented systems are subject to the trading rules of the ROP or ROL (in the latter case, where streams are supplemented) (WA 2000, s. 134).¹³

A seasonal water assignment is a temporary transfer of part or all of an announced allocation within a water year.¹⁴ Seasonal water assignments can be made if the WRP or ROP allows seasonal assignments in the area and if the water is not managed under a ROL (WA 2000, ss. 141–146). The assignment undergoes an approval process similar to that of changes, transfers and leases.

Though water allocations are transferrable and there are no restrictions in terms of their ownership or their intended use WRPs published to date indicate that there is an expectation that most water allocations will continue to be used towards consumptive uses, even after any possible trades that may occur.

¹³ Trading rules are established in the ROP and are set to limit water trades to those situations that are hydrologically possible so that environmental flows and water allocation security objectives are met.

¹⁴ A water year is defined by the WRP. In the interim ROL of the Maranoa River Water Supply Scheme (November 2000), a water year is defined to be the period between 1 September and 31 August.

5 Government involvement in water allocation

5.1 Allocation mechanisms

Water trading is the main mechanism by which water allocations are re-allocated between water users. NR&M can also re-allocate water administratively between consumptive users and the environment following a review of a WRP.

An owner of a water allocation is only entitled to be paid reasonable compensation following an administrative re-allocation for a reduction in the value of an entitlement if:

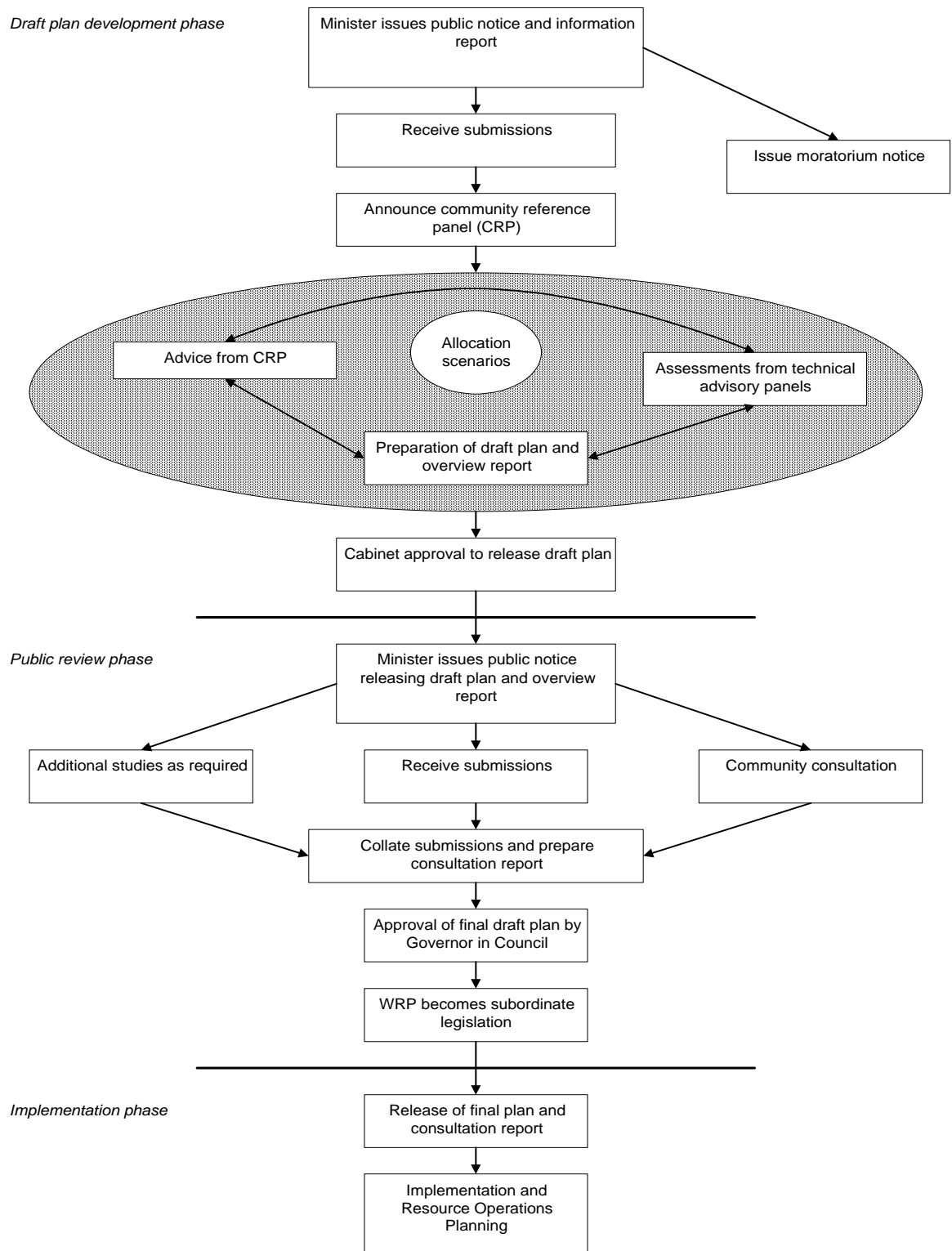
- a change reduces the value of the allocation; and
- the change is made within 10 years after the water resource plan is approved (WA 2000, ss. 985 and 986).

5.2 Resource planning

As mentioned earlier, the resource planning process described in the WA 2000 provides for the preparation of WRPs and ROPs.

The process for preparing WRPs comprises a draft plan development phase, a public review phase and an implementation phase (see figure 5.1). WRPs prepared under this process may take into account a range of matters described in the WA 2000 (see figure 5.1).

Figure 5.1 Process for preparing Water Resource Plans



Source: NR&M (2001d).

Under the WA 2000, WRPs must contain provisions for enforcing, investigating and initiating legal proceedings for offences under the legislation, procedures for reviewing appeals and arbitration, compensation measures and transitional issues.

Where a WRP provides water allocations (including the conversion of existing licences to water allocations), the plan must also state the environmental flow objectives, security objectives of the entitlements, the performance indicators, and the rates for converting area-based licences to volumetric licences (see box 5.1).

Box 5.1 Matters contained in a Water Resource Plan

Under the *Water Act 2000* (s. 46(1) and (3)), the Department of Natural Resources and Mines must consider a range of matters when preparing a Water Resource Plan (WRP). The WRP must state the:

- purpose of the WRP and the water to which the WRP is intended to apply;
- water and natural ecosystem monitoring requirements;
- outcomes, including ecological outcomes;
- proposed water strategies to achieve the outcomes to the extent possible from the best scientific information available;
- periodic reporting requirements; and
- timetable for implementing the WRP.

If a WRP provides a framework for establishing water allocations, it must also state the:

- environmental flow objectives;
- water allocation security objectives;
- performance indicators for environmental flow objectives and water allocation security objectives; and
- priority areas for the conversion to or granting of water allocations.

Under the *Water Act 2000* (s. 46(2)), the type of works for the taking of overland flow and sub-artesian water, and information about water available for future consumption must also be described.

Source: Water Act 2000.

As mentioned earlier, ROPs contain the operational rules governing water allocations. These include but are not limited to rules governing the assignment of water to entities at the beginning of each season ('water sharing rules'), operating infrastructure assets, managing environmental flows ('environmental flow rules'), permanent trades of water allocations ('water trading rules'), and temporary trades ('seasonal water assignment rules') (see box 5.2).

Box 5.2 Rules defined by Resource Operations Plans

Resource Operations Plans (ROPs) contain details of the area and infrastructure to which the plan applies. Under the *Water Act 2000* (s. 98), ROPs may include:

- licence conversion rules;
- water sharing rules;
- infrastructure operating rules;
- water trading rules;
- seasonal water assignment rules;
- environmental flow rules;
- monitoring requirements;
- a statement of how the chief executive of the relevant authority will sustainably manage water to which the plan applies;
- process for granting reserving or otherwise dealing with unallocated water;
- a process for meeting future water requirements;
- a minimum share of overland flow water which each owner of land in the ROP area may take — if the ROP provides for the regulation of overland flows; and
- the rules for and details of any proposed conversions of existing water licences and interim water allocations to water allocations.

Source: Water Act 2000.

Resource assessment

The WRP process provides for preliminary assessments of water volume, balances, conditions of river basins and aquifers, and natural flow requirements. During the drafting of a WRP, the Minister must consider the duration, frequency, size and timing of water flows necessary to support natural ecosystems, and must use the best scientific evidence available (WA 2000, s. 47).

Environmental assessments are concerned with the environmental condition of aquatic ecosystems within a WRP's area. NR&M is required to assess the current environmental flow condition and include advice on the environmental implications of various water allocation and management scenarios.

In practice, environmental assessments involve a number of studies being undertaken by technical advisory panels. The advice provided by the panels is based on current environmental flow conditions and the environmental implications of various water allocation and management strategies.

Hydrological investigations are undertaken using basin-wide hydrological models to investigate the impacts of current scenarios, draft plan water allocation scenarios and final plan water allocation scenarios. Hydrological models simulate hydrological events, including daily streamflows, flow management, storage releases, instream infrastructure, water diversions and water demands.¹⁵

Objectives

WRPs contain minimum environmental performance standards in the statement of environmental flow objectives and performance indicators. Any allocation of entitlements must be consistent with these standards. For example, the Burnett Basin WRP outlines a number of matters — including environmental — that the Chief Executive of NR&M must consider before granting new entitlements (see box 5.3).

Under the WA 2000, if a WRP provides for the transfer of water allocations, it must also state:

- environmental flow objectives;
- water allocation security objectives;
- performance indicators and criteria for both of the above; and
- priority areas for establishing water allocations (see box 5.1).

NR&M must also consider potential third-party effects that can affect water users. These third-party effects are addressed by specifying security objectives for water allocations. As noted, given the risk of sleeper and dozer licences being activated, such licences are treated as normal licences for purposes of the initial allocation of entitlements under a WRP, and for subsequent approvals.

Impact assessment

Under the WA 2000, NR&M is required to take into account the impacts on cultural, economic and social values (including future requirements), the support of natural ecosystems and other effects when preparing a WRP. To facilitate this, NR&M undertakes a number of socioeconomic and environmental impact studies — though the extent to which these are undertaken vary between catchments. Some of the issues considered when preparing these studies have included: the direct

¹⁵ The department uses an Integrated Quantity and Quality Model program. The performance indicators are calculated based on a simulation period. For the Burnett Basin the simulation period extended from 1890 to 1997.

economic impact for principal water users; economic benefits to other sectors; and the social and cultural heritage impacts. Scenarios are used in accessing the impacts of differing flows.

Box 5.3 Burnett Basin — matters the Chief Executive must consider

Under the Burnett Basin Water Resource Plan, the Chief Executive of the Department of Natural Resources and Mines is required to consider a number of matters when issuing new water allocations. These include:

- the availability of water for the purpose for which it is intended to be taken;
- the availability of an alternative water supply for the purpose including the more efficient use of water already available;
- whether the taking should be restricted during particular periods including when,
 - there is no water flow in a watercourse, or
 - the water flow is insufficient for downstream water users or to sustain the health of an ecosystem, or
 - water is released for the benefit of the environment;
- the impact of the proposed taking or proposed water infrastructure on the following,
 - water quality,
 - inundation of streambed habitat,
 - the movement of fish and other aquatic species,
 - the natural variability and duration of seasonal streamflow patterns,
 - the extent to which rapid artificial variations in instream water levels may adversely affect the environment; and
- whether the taking is likely to adversely affect the water quality and the ecology of the watercourse into which the water is transferred — if the taking involves the transfer of water between watercourses in different river basins.

Source: Water Resource (Burnett Basin) Plan 2000.

Consultation

Under the WA 2000, CRPs are established to provide NR&M with advice of community views (WA 2000, s. 41). The composition of CRPs varies between WRPs. They may include representatives from consumptive and non-consumptive user groups, industry, conservation groups and indigenous groups. CRPs do not have authority to approve the final draft of a WRP.

Community consultation has also occurred through the establishment of Indigenous Working Groups. These groups comprise local clan representatives who are

responsible for providing NR&M with advice of issues that are of most concern to indigenous communities.

In addition, public submissions are invited in both the draft plan development and public review phases of the process of preparing a WRP. The Minister must issue a public notice and information report in the draft plan development phase prior to initiating submissions. The Minister must also issue a public notice releasing the draft plan and overview report in the public review phase of the planning process.

Review

Under the WA 2000, NRM is not obliged to conduct a regulatory impact statement (RIS) for each WRP, even though these are subordinate legislation (WA 2000, s. 58). Instead, a WRP has a life of 10 years, after which it is intended that it will be reviewed for subsequent adjustment and renewal.

As the WA 2000 is relatively new, no WRPs have been reviewed. It is difficult to ascertain the consistency and depth of a 10 year review.

It is intended that a WRP's 10 yearly review will replicate features of its initial drafting. The Minister will be required to consider the cultural, economic and social values, along with the state's future water requirements, including cultural, economic, environmental and social requirements (WA 2000, s. 47).

In addition, WRPs are subject to periodic assessment (see box 5.4). There is a recognition that over time, scientific knowledge will improve and this will provide opportunities to improve a WRP. Periodic reporting allows for continuous assessment (and therefore adaptive management) of the ability of a WRP to meet its stated outcomes and whether its objectives continue to promote sustainable management.

If following a periodic review, the Minister is satisfied that a WRP's environmental flow or security objectives of water allocations are not being met, are inappropriate or do not support sustainable development, the Minister may amend or replace the WRP — before the end of WRP's statutory life (WA 2000, ss. 55–57).

Box 5.4 Periodic reporting requirements

Water Resource Plans (WRPs) will also outline the requirement for periodic reporting against the plan. Such reports are required by the *Water Act 2000* (s. 54) to include:

- a summary of the findings of research and monitoring for the WRP;
- an assessment of the effectiveness of the implementation of the WRP in meeting the plan's objectives;
- an assessment of whether the WRP's objectives, having regard to any new information available about water that is the subject of the WRP, are continuing to promote sustainable management and the efficient use of water and other resources;
- a summary of total water entitlements covered by the WRP;
- information about any non compliance with the WRP and its resource operations plan; and
- particulars of any changes made to the WRP.

Source: Water Act 2000.

6 Administering entitlements

Administration involves the granting of entitlements (water licences and allocations), and approving the proposed transfer and modification of water allocations. Water allocations may be transferred temporarily or permanently. Water allocations can be modified to facilitate transfers between locations and purposes. Water allocations can be changed in terms of the:

- purpose for which the water may be taken;
- volume of a water allocation;
- location at which water can be taken;
- priority group of a water allocation;
- maximum rate of extraction; and
- flow conditions under which water may be taken.

In general, the rules for administering entitlements are outlined in WRPs and ROPs. There are also contractual arrangements, contained within supply contracts, which impact upon the administration of water allocations and licences.

6.1 Applications

Applications must be made to the ROL holder if the application is for a supplemented water supply and the rules are governed by the relevant ROP. Otherwise, applications must be made to the Chief Executive of NR&M.

Applications generally require the use of a standardised and approved form. Applications to the chief executive must be accompanied by a fee determined by a regulation (WA 2000, ss. 129–130).

Separate application processes are required for the construction of water works and for the approval of LWMPs.

6.2 Consultation

An application for a new, modification to or transfer of a water allocation will be given public notice if the relevant ROP provides for the public notification — although this is generally not the case (Dixon 2000). Applications for new water licences not covered by a ROP, must be given public notice unless the Chief Executive of NR&M decides otherwise. The chief executive must also give public notice of an application and invite public submissions if the rules of ROP do not provide for provide for the modification or transfer of a water allocation.

If a public notice is given, the chief executive must consider the public's submissions in deciding whether or not to approve an application. If the chief executive is satisfied that there will be considerable expense incurred in researching and investigating the application, the applicant has to meet the costs.

6.3 Assessment

Processes for issuing, modifying and transferring entitlements might also be outlined in the ROP and ROL. If this is the case, applications are assessed in accordance with the relevant plan or licence.

Issuing new entitlements

If a WRP or ROP has been approved for an area, entitlements must be granted in accordance with the plan. NR&M is required to consider a range of factors when granting new entitlements. These include whether there are existing water entitlements, the effect of the entitlement on the ecosystem, and physical integrity of the water source, sustainable resource policies and the public interest.

In several cases, WRPs and ROPs limit who can apply for a new entitlement, the volume of water that can be granted, the location from which water can be taken and the priority of the entitlement. For example, under the Boyne Basin Draft ROP, only the operator of the Awoonga Dam is eligible to be granted additional water allocations, and then only if the amount of water stored in the dam increases.

Under the Cooper Creek WRP, the Chief Executive of NR&M may issue a licence or permit only if:

- the entitlement is to be granted to an existing irrigation development; and

-
- the works to be used for the irrigation were in existence immediately before 1 May 1998 and were capable of being used for the existing development (Water Resource Plan (Cooper Creek) Plan 2000).

In contrast, under the Fitzroy Basin Draft ROP, unallocated water may be made available through ballot or competitive bidding (NR&M 2002c).

A WRP or ROP can place constraints on the issue of licences or permits to take groundwater. For example, a licence or permit to take water from an aquifer can only be granted if the proposed rate of extraction does not exceed the aquifer's rate of recharge.

WRPs may constrain the issue of new licences to certain uses. For example, under the Coopers Creek WRP, new licences can only be issued for:

- domestic use;
- town water supply;
- the watering of stock;¹⁶
- emergency purposes;
- irrigating crops (for feeding stock if the crop area is no greater than 10 ha, or horticultural crops on an area of not more than 2 ha); and
- drilling or exploration work authorised under government legislation, and construction and road building.

New ROLs are granted in accordance with the relevant ROP. Under the transitional arrangements, an interim ROL is converted to a ROL on the day a ROP takes effect (WA 2000, s. 107).

Transferring water allocations

A ROP's transfer rules can limit the volume of water that can be transferred between locations (such as whether inside or outside of Queensland) and for different purposes (WA 2000, s. 98). Transfer rules may require the application of an exchange rate to account for the environmental, social or economic impacts. Both provisions are intended to ensure that transfers that could cause significant social or economic impacts on an area do not occur without prior assessment of whether the transfer is in the public interest (Queensland Government 2001).

¹⁶ Stock not more than the number normally depastured on the land, and not held in close concentration for a purpose other than grazing; or stock travelling on a stock route.

A ROP may also require applicants to prepare a land and water management plan, such as when water allocations are purchased or leased by irrigators (DNR 2000).

The WA 2000 makes no distinction between interstate and intrastate trading. However, the Act does not prohibit individual WRPs and ROPs from proscribing or limiting interstate trades. To date there have been no applications for interstate trades (NCC 2001).

6.4 Decision notification

The applicant and any person who makes a submission on an application will be given an information notice regarding the decision within 30 business days of the decision having been made.

6.5 Hearing appeals

Any person who receives an information notice can appeal the administrative decision.¹⁷ If an administrative decision was made in accordance with the provisions of ROP, an appeal can be made on the grounds that the decision is inconsistent with the ROP or that a different decision could have been made that was consistent with the ROP.

Any appeal against a decision must first undergo a process of internal review. Applications for internal review must be made within 30 days of an information notice being given. Submissions made by the applicant must be considered and a decision must be made within 20 days. If the decision does not support the applicant, the reasons for the decision must be stated.

After a review, dissatisfied applicants have 30 days in which they can seek arbitration. Alternatively, licence or allocation holders may seek to appeal against the review decision in the Land Court.

The court of appeal has the power to confirm, set aside, amend, send back to review or substitute the review decision.

¹⁷ Once a water licence, water allocation or change to a water licence has been granted the Chief Executive must issue an information notice to the entitlement holder.

6.6 Registration procedures

All grants, changes and transfers of water allocations must be entered on the Water Allocations Register. In supplemented systems, a new or transferred water allocation will not be registered until evidence is given to the registrar by the ROL holder of the existence of a supply contract. All grants, modifications and transfers to water allocations take effect the day that they are registered.

Details of water licences are placed on a register held by the Department of Natural Resources and Mines on the Water Entitlements Registration Database.

7 Distribution management

7.1 Water accounting

Every season, water supply managers (such as dam operators in supplemented systems and NR&M in unsupplemented systems) ensure that water is distributed to entitlement holders and the environment. At a broad level, the supply of water is dictated by the security objectives of the entitlements and the environmental flow objectives of the system.

Determining water availability and assignment of water

The operating requirements of a storage operator are described in their ROL (or IROL). ROLs contain water sharing rules that govern how water is to be shared between entitlement holders and reflect the rules contained in the ROP (see box 5.2). Water sharing rules are specific to each ROL and are based upon the security objectives described in the overarching WRP.

A WRP's security objectives for entitlements often distinguish between several priority groups to water — such as high, medium and low priority. The water sharing rules describe how the storage operator is to assign water to each of those priority groups. For example, the storage operator may be required to fulfill medium-priority entitlements only after all high-priority entitlements have been met but before low-priority (or 'risk') entitlements are to be met. A ROL holder may also be obliged under to hold sufficient water in storage to meet the security objectives of high-priority water allocations for the next season.

The water sharing rules in a ROL are usually specified as a formula — the 'Resource Assessment Formula'. In the case of the Bundaberg Water Supply Scheme, the extent to which a medium security entitlement will be met is given by the usable volume of water in storage, the projected flow of water into storage, allocations of water to high-priority entitlements (including conveyancy losses and high-priority reserves), the volume of water to be carried over to the next year, as well as transmission losses (see box 7.1).

Box 7.1 Resource Assessment Formula for the Bundaberg Water Supply Scheme

The calculation for the announced allocation (AA) for medium priority holders managed under the Bundaberg Water Supply Scheme is given by the resource assessment formula:

$$\text{AA (per cent) for medium priority} = \frac{[\text{UV} + \text{IN} - (\text{SL} + \text{HP} + \text{RE} + \text{CO}) + \text{FD}]}{\text{Total medium priority allocation}} \times \text{TE} \times 100$$

There are a number of factors which may enter into the calculation of announced allocations. These include:

- usable storage volume (UV) — usable storage is the volume of water stored exclusive of the volume of water stored below the level of the outlet works or pumps (unusable water);
- inflow (IN) — a projected minimum inflow of water;
- storage losses (SL) — projected storage losses for the water year. This may be defined as storage evaporation plus seepage minus direct rainfall into the storage and weirs;
- high priority demands (HP) — the volume of water allocated to high priority entitlements and may include provisions for river transmission losses;
- high priority reserve (RE) — the storage volume set aside to provide future supply of high priority interim water allocation for a specified number of months beyond the current water year, including provision for possible river transmission losses;
- carryover (CO) — water carried over from previous years unused announced allocations. Carryover includes provision for transmission losses and is discounted to allow for storage losses at specified periods from the beginning of the water year;
- forward draws (FD) — water taken in the previous year from the current year's expected announced allocation (also known as advance draw);
- the river transmission efficiency factor (TE); and
- the number of medium priority allocation holders.

Source: NR&M (2000c).

The banking of water between periods is achieved through carry-over and forward-draw facilities. The carry-over facility allows entitlement holders to hold over any unused water to the next year — although this volume is discounted for storage losses.

The forward-draw facility permits entitlement holders to draw forward next season's allocation. This facility is usually limited to high-priority entitlements, and only when sufficient volumes of water are available. However, the extent to which

this facility is available. Some IROLs do not make this service available, and there is no explanation of the process used in determining whether the service will be extended to holders.

Reporting requirements

A ROL's water sharing rules are publicly available from NR&M. In addition, the ROL holder is required to monitor their water resources and environmental water quality. This information must be provided to NR&M within three months of collection. Further, each ROL holder must report to NR&M at the end of each water year.

A ROL holder's report must describe all decisions associated with the management of water infrastructure, circumstances where the requirements of the ROL were not met, and the details of any actions relevant to the outcomes of the ROL which are taken in response to emergencies.

Managing water accounts

In supplemented streams, the ROL holder maintains information about the announced allocations and of the water supplied to the water allocations along that stream. This information can be made available to the water allocation holder, in accordance with the requirements of the water supply contract between the ROL holder and the water allocation holder.

The ROL holder may also be required to provide some of this information to NR&M as part of the ROL holder's reporting requirements.

In unsupplemented streams, NR&M maintains a database of the announced allocations and of the water supplied to the water allocation holders of that stream. This information is not publicly available.

7.2 Water distribution

As mentioned earlier, each WRP states a number of environmental flow objectives that stipulate the overall environmental outcomes that are to be achieved within a catchment (see box 5.1).¹⁸

¹⁸ Objectives are specified for a range of flows such as the base seasonal flow, the first post-winter flow, and the medium and high flow event flows.

To meet these objectives, environmental flow rules are described in the ROP and, in the case of supplemented systems, the ROL. Environmental flow rules describe the volume of water that must be provided by the ROL holder or NR&M for certain nominated monitoring points. These rules act as upper and lower constraints on the volume of flow that can be provided at certain times of the year.

A ROL's (or IROL's) operating requirements will describe a number of specific requirements for the infrastructure operator. These can include:

- the minimum pass flow requirements for the environment;
- the minimum, maximum and average flow releases that must be maintained by the storage operator;
- the minimum volume of water that must be maintained in storage for the protection of fauna; and
- a requirement to provide fish transfer devices (such as ladders) at certain infrastructure (NR&M 2000d).

8 Pricing

The Council of Australian Governments' (CoAG) Water Resources Framework (1994) was adopted to improve the efficiency of water allocation. It recommended *inter alia* the adoption of consumption-based pricing, full cost recovery of infrastructure service delivery where appropriate, and allowing water to be traded to its highest valued use (CoAG 1994).

Under the CoAG water reform framework, a set of cost recovery guidelines provides jurisdictional regulators with a framework for interpreting the requirements for full cost recovery. Regulators are required to ensure that a water utility sets prices between avoidable costs and stand alone costs, to ensure commercial viability and avoid monopoly rents.^{19,20}

8.1 Price regulation

As mentioned earlier, the QCA is involved in monopoly prices oversight in the water industry. Water service providers who have been declared for prices oversight include SEQWater (declared March 2000), and the Gladstone Area Water Board (declared September 2000), SunWater and the Mount Isa Water Board. The largest 18 local government retail water and sewerage businesses were declared for prices oversight in June 2001.

In addition, the Queensland Government has set five to seven year price path for 25 of SunWater's 27 rural irrigation schemes. SunWater accounts for 40 per cent of the water used for irrigation in Queensland.

¹⁹ The CoAG 1997 pricing principles state that to be viable, a water business should recover at least the operations, maintenance and administrative costs, externalities (that is, natural resource management costs attributable and incurred by a water business), taxes or tax-equivalents (not including income tax), the interest cost on debt, dividends (if any) and make provision for future asset refurbishment or replacement using an annuity approach.

²⁰ To avoid monopoly rents, the CoAG 1997 pricing principles state that a water business should not recover more than operations, maintenance and administrative costs, externalities, taxes or tax-equivalents, and the provision for the cost of asset consumption and cost of capital, the latter using a weighted average cost of capital.

8.2 Pricing water as a scarce resource

As mentioned earlier, trading of water allocations, both temporary and permanent, is encouraged as a means to re-allocate water between users. Trading is normally available within the irrigation schemes, however in 2000–01 permanent trades were only recorded in the Mareeba–Dimbulah scheme (ANCID 2001). Temporary trading took place in all the irrigation schemes reporting to the Australian National Committee on Irrigation and Drainage.²¹

In addition, SunWater holds a number of water allocations and trades them on the water market. It has also developed a range of products associated with trading — including fixed-term water allocation contracts and derivative products such as options. In 2000–01, approximately 5.3 GL was traded in water supply schemes.

8.3 Pricing water service provision

Supplying water infrastructure services incurs costs associated with operation, maintenance, administration, capital (such as debt servicing), dividend payments, as well as commitments to taxes and tax-equivalents and managing environmental and other third-party effects.

Cost recovery

These price paths are set ensure that by 2004 most irrigation schemes would recover the costs of operation, maintenance, administration, refurbishment, tax, interest on debt and third-party effects. Price paths generally do not include the addition of a commercial return on assets.

The price paths were based on a set of principles developed by the QCA (2000). The statement sets out the principles applied to monopoly price setting. These state that the price of water delivered to an end user should:

- be cost reflective;
- be forward looking; and
- ensure adequate revenue to promote sustainable development, regulatory efficiency and take into account the public interest.

²¹ Irrigation schemes that reported temporary trades were: Bundaberg, Burdekin–Haughton, Dawson Valley, Eton, Mareeba–Dimbulah, Mary River, Nogo–Mackenzie and St George. Information was not available for South Burdekin.

The costs considered in the setting of the price paths were identified through an independent review of SunWater's delivery costs. This review included a benchmarking study comparing SunWater to other water service organisations (NR&M 2002d).

Price structure

Since 1997, rural water delivery has been subject to a two part pricing tariff. The tariff is structured to include a fixed charge based on a nominal water allocation and a consumption-based (or variable) charge that reflects the volume of water actually used throughout the year. The fixed charge component of the tariff is not adjusted in very dry years, when an irrigator's nominal water allocation may not be available.

9 Monitoring and enforcement

The obligations, authorisation, enforcement procedures and penalties relevant to water allocations and licences are contained in the WA 2000. The Act establishes a monitoring and enforcement framework that provides the Minister with a range of powers to ensure compliance with the Act. Many of the Minister's functions and powers of enforcement have been delegated to NR&M as the primary enforcement agency.

The WA 2000 grants powers of search and entry to authorised officers. An authorised officer has the power to enter land to monitor compliance with the Act, to collect information or to search for unauthorised activities.²²

Officers may enter land in order to:

- read, repair or replace measuring devices;
- measure the water taken, interfered with or used;
- ensure compliance with WRPs and ROPs and the conditions attached to water licences and water allocations.
- take samples of soil or water from the land;
- construct monitoring equipment;
- measure the health of watercourses, lakes, springs and aquifers; or
- investigate unauthorised activities.²³

In order to gain entry to land for purposes other than those listed above, an officer must obtain the consent of the occupier or a warrant issued by a magistrate. The authorised officer is required to carry an identity card (WA 2000, s. 744). If necessary, the officer may use force in entering land to search for unauthorised activities (WA 2000, s. 748).

²² Land is defined by the WA 2000 to mean a parcel of land other than the part on which there is erected a dwelling.

²³ Under the WA 2000 (ss. 746–749), unauthorised activities include drilling without permission; taking of, interfering with or use of water, taking of other resources; and, interference without permission of the physical integrity of a watercourse, lake or spring.

9.1 Monitoring procedures

The framework for monitoring Queensland's water resources and the enforcement procedures and penalties will be set out in the WA 2000.

The water and natural ecosystem monitoring practices that apply to a particular catchment are contained within the relevant WRP and ROP (see box 9.1). All water allocations created by WRPs or ROPs are required to be metered before the water can be used.

Box 9.1 Monitoring requirements for Resource Operating Licence holders in the Fitzroy Basin

Resource Operating Licence (ROL) holders must undertake an water in storage and released, including:

- inflows to dams weirs and barrages associated with the water project area;
- flow at all gauging stations associated with the water project area;
- volumes released through dams weirs and barrages within the water project area — for consumptive purposes, environmental flow requirements, operation of fish-ways and other purposes as determined by the chief executive;
- deliveries and diversions of supplemented water supplies from each section of watercourse lake or spring within the water project area;
- dam and weir pool levels; and
- multi-level off-take and other outlet works operations.

ROL holders must also monitor water and aquatic ecosystems:

- water flows at designated points along a stream;
- frequency, duration and seasonality of stream flow events;
- water quality;
- aquatic macro vertebrate species diversity, abundance and composition;
- the condition of water hole and lake ecosystems, stream bed habitats, upper and in channel riparian zone, floodplains and connected wetlands;
- morphological processes; and
- key biological trigger processes.

Finally, ROL holders are required to implement an ongoing water quality monitoring program. Items to be monitored include the physical, chemical and biological measurements of waters stored in or released from dams, weirs and barrages.

Source: NR&M (2002e).

In supplemented systems, the ROL (or IROL) also states the requirements for monitoring and reporting on water managed and water infrastructure operations (WA 2000, ss. 110 and 177). The WA 2000 may also require water licence holders to carry out and report on a stated monitoring program (WA 2000, s. 214).

In supplemented systems, it is the responsibility of the ROL holder to ensure that all water use is metered. Metering ownership arrangements are determined by the ROL holder and the water user (NR&M 2002f). ROL holders must report to NR&M on:

- all decisions associated with the management of water allocations and infrastructure within the water project area including;
- announced allocations;
- any restrictions and carry-overs in regard to announced allocations;
- any infrastructure modifications or installations;
- flow event management — circumstances where the requirements of a resource operations plan were not met by the water operator; and
- details of any remedial action taken to address a requirement of a resource operations plan or in response to transient water quality issues.

In unsupplemented systems, some monitoring may be conducted by NR&M of specific issues such as illegal capture of overland flow. Monitoring may also occur as a response to a complaint or information received by NR&M. NR&M may also undertake general surveillance.

In the absence of ROL holders in unsupplemented systems, monitoring is largely the responsibility of water allocation holders. Water allocation holders meter their extraction of water. For example, in the Fitzroy Basin, a water allocation holder must:

- advise NR&M prior to taking water;
- provide recordings of water taken to NR&M; and
- only take water during announced periods.

9.2 Enforcement procedures

NR&M is responsible for ensuring compliance with conditions on licences and permits as prescribed in the WA 2000. Under the WA 2000 (part 3), the offences and their associated penalties apply to the:

- unauthorised taking, supplying or interfering with water;
- use of water contrary to a water use plan;

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- use of water contrary to an approved land and water management plan;
 - tampering of devices used in the monitoring of water;
 - contravening of conditions of water allocation, interim water allocation, water licence or permits;
 - contravening of conditions of resource operations licence, interim resource operations licence or operations licences;
 - destruction of vegetation, excavation or placing of fill without permit; and
 - unauthorised water bore activities.

If a water user takes unauthorised water, and this is recorded by a meter, the water user will receive either an infringement notice and be required to pay a fine, or be subject to prosecution. Entitlements to extract water may also be suspended or cancelled.

Under the WA 2000 (s. 138) sets out the procedure by which a entitlement holder may forfeit their water allocation. If a water allocation holder has been convicted of an offence against the Act they may be issued with a *show cause notice* as to why the allocation should not be forfeited.

NR&M, after consideration of any properly made submissions, may forfeit the allocation. The water entitlement holder may then seek appeal against the forfeiture. Upon forfeiture NR&M must sell the allocation by public auction, public ballot or public tender.

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