Assessment of Governments' Progress in Implementing the National Competition Policy and Related Reforms

SOUTH AUSTRALIA WATER REFORM

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The National Competition Council

The National Competition Council was established on 6 November 1995 by the *Competition Policy Reform Act 1995* following agreement by the Commonwealth, State and Territory governments.

It is a federal statutory authority which functions as an independent advisory body for all governments on the implementation of the National Competition Policy reforms. The Council's aim is to 'help raise the living standards of the Australian community by ensuring that conditions for competition prevail throughout the economy which promote growth, innovation and productivity'.

Information on the National Competition Council, its publications and its current work program can be found on the internet at www.ncc.gov.au or by contacting NCC Communications on (03) 9285 7474.

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Abbreviations

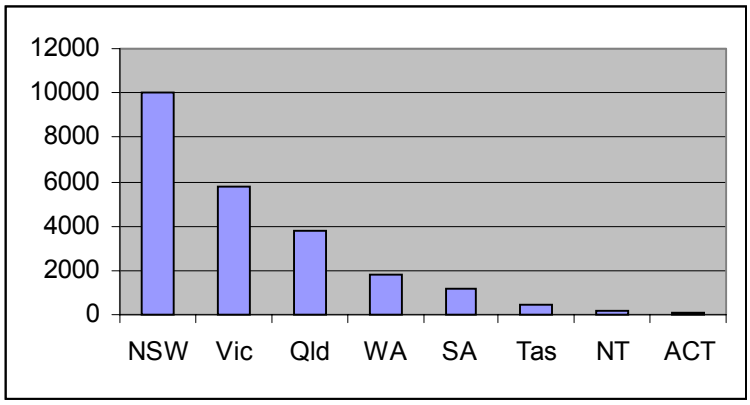
ANCID	Australian National Committee on Irrigation and Drainage
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
CoAG	Council of Australian Governments
CSIRO	Commonwealth Science and Industry Research Organisation
CSO	Community Service Obligation
CWMP	Catchment water management plans
DWR	Department of Water Resources
HLSGW	High Level Steering Group on Water
MDBC	Murray-Darling Basin Commission
NCC	National Competition Council
NCP	National Competition Policy
NLWRA	National Land and Water Resources Audit
NWQMS	National Water Quality Management Strategy
SA Water	South Australian Water Corporation
WAPs	Water allocation plans
WSAA	Water Services Association of Australia

Introduction

For the last seven years governments across Australia have been implementing the strategic framework for the reform of the Australian water industry. As the reform program is progressing, there has been a growth in both the understanding of the complexity of these reforms and the level of national recognition of the importance of change.

Australia's water use is growing. Water use grew by 59 per cent between 1983-84 and 1996-97, mostly due to increases in irrigated agriculture. Chart 1 illustrates the level of water use for each State and Territory in 1996-97.

Chart 1: Mean annual water use 1996-97 (GL)



Source: National Land and Water Resources Audit (2001)

There has been significant progress since governments first agreed to the reform framework.

- Metropolitan water businesses have shifted from being part of a larger government bureaucracy to customer focussed commercial operations. This has generated benefits such as a real reduction in customer bills of nearly five per cent over the last four years, with improvements in drinking water quality and effluent treatment.

- Most urban Australians face water prices that reflect the amount of water they use and to create an incentive to conserve water.

- The need for water to be allocated to the environment is legally recognised across Australia.

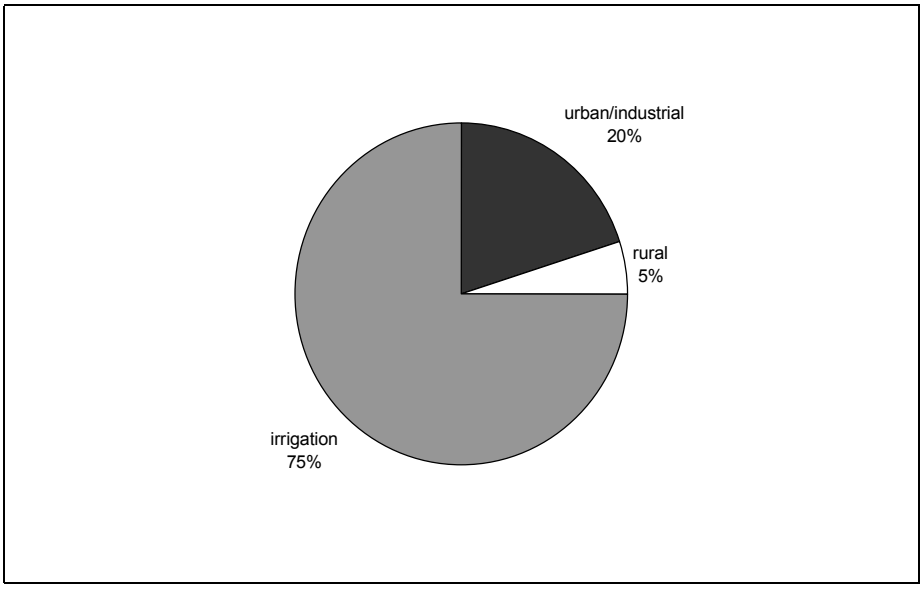
- Regional planning processes on natural resource management issues have started in all States and Territories and communities are heavily involved in consultation on these processes.

- All governments recognise the difficulties that are arising from incomplete scientific information on the ecology and hydrology of water systems, particularly groundwater systems. Governments are addressing this by adopting a precautionary approach to any further allocations of water and increasing the level of monitoring and research.

This is the National Competition Council's second major assessment of the implementation of water reform. The first (the second tranche assessment in June 1999) focussed on the passage of legislation and urban water reform. The June 1999 assessment identified a number of issues that needed to be progressed further before the Council could conclude that all of the States and Territories had met their water reform commitments. Consequently, following the June 1999 assessment there were four follow-up or supplementary assessments that addressed outstanding issues from the 1999 assessment.

The 1999 assessment process saw the passage of legislation that provides the overarching framework for many of the water reforms. The current assessment starts the process of reviewing how these frameworks are being implemented and whether, in practice, they are delivering appropriate reform outcomes. Previous assessments also focussed on the implementation of reforms in the urban sector because the timeframes in the CoAG water reform agreements envisaged urban reforms occurring first. However, as illustrated in chart 2, rural and irrigation water makes up the majority of water use in Australia.

Chart 2: Mean annual water use by category 1996-97 (gigalitres)



Source: National Land and Water Resources Audit (2001)

The Council's 2001 NCP assessment has a much broader focus. While it discusses outstanding urban pricing issues its primary emphasis is on the rural sector covering, pricing, property rights, water trading and environmental issues. This is the first assessment in which the agreements call for the Council to examine the detail of rural reform.

The 2001 NCP assessment has also recognised the importance of establishing clear property rights and allocating water to the environment through a transparent process of community based planning. The key elements of these processes are:

- governments setting timetables and supporting the development plans;
- community consultation and involvement in the planning process;
- the development of scientific information on which to base the plans; and
- finalised plans that provide:
  - sufficient information for stakeholders to understand the plan and its implications for irrigators, the environment and the community generally;
  - water for the environment in a way that reflects the current understanding of environmental needs; and
  - well defined water allocations that provide irrigators with predictability in their property rights.

Assessment

In its assessment the Council has identified that an important issue for New South Wales is the development of well defined property rights, including an appropriate registry system, while for Victoria the assessment raises issues about the process for allocating water for the environment. Both States have provided substantial responses to the Council detailing how they intend to deal with these issues both over the next twelve months and into the future. These will be important issues in the Council's 2002 NCP water assessment. New South Wales is consulting with stakeholders and will review its policy on the water rights registry system before November 2001. The Council will reassess New South Wales's approach to the water rights registry in December 2001.

Overall the Council's 2001 NCP assessment has concluded that all States and Territories have made sufficient progress to receive their 2001-02 NCP payments. However, while the Council found that the Queensland Government has taken a positive and active approach to encouraging reform among local governments, one local government, Townsville City Council has failed to explain why introducing reform of water pricing within its jurisdiction is not in the public interest. In this assessment, the Council recommended a permanent reduction of $270 000 in Queensland's NCP payments from 2001-02 (reflecting the remaining money available to Townsville Council for water reform through the Queensland Competition Authority's Financial Incentive Scheme). This reduction relates to the failure

by Townsville City Council to take a rigorous approach to considering consumption-based price reforms. The Council will reconsider Townsville's approach to two-part tariffs in the 2002 NCP assessment. It will look at both the progress made by Townsville and the State Government's efforts to resolve the issue. At that time, the Council will reconsider whether a continued reduction in competition payments is warranted and the appropriate size of any such reduction.

Finally, Queensland has acknowledged that the Condamine-Balonne is now a stressed river system. Consequently, the establishment of water allocations for the environment and consumptive use is now overdue. The Council will address this issue in its 2002 assessment. The Council is not satisfied that any of the options for setting environmental allocations specified in the draft water resources plan would be adequate to meet the environmental needs of the lower Balonne basin and the internationally listed Narran Lakes wetlands. More generally, the Council is not satisfied with the transparency of current reporting arrangements of the Government's final decisions for setting allocations. Queensland has agreed to address this concern over the next 12 months.

Local and national approaches to reform

The reform framework is a comprehensive approach that addresses the environmental, economic and social issues associated with water reform. It covers both surface and groundwater and recognises that while water reform is primarily a State responsibility some issues need to be addressed by coordination and cooperation between state initiatives. The approach to the Murray-Darling Basin is an obvious example.

State and Territory governments recognise the need for a more coordinated approach and are increasingly looking at water reform issues jointly. While some of these processes are in their early stages, it is the Council's view that they need greater emphasis if water reform generally is going to deliver the outcomes all stakeholders recognise as necessary. The following are examples where national approaches have been initiated to address important reform issues.

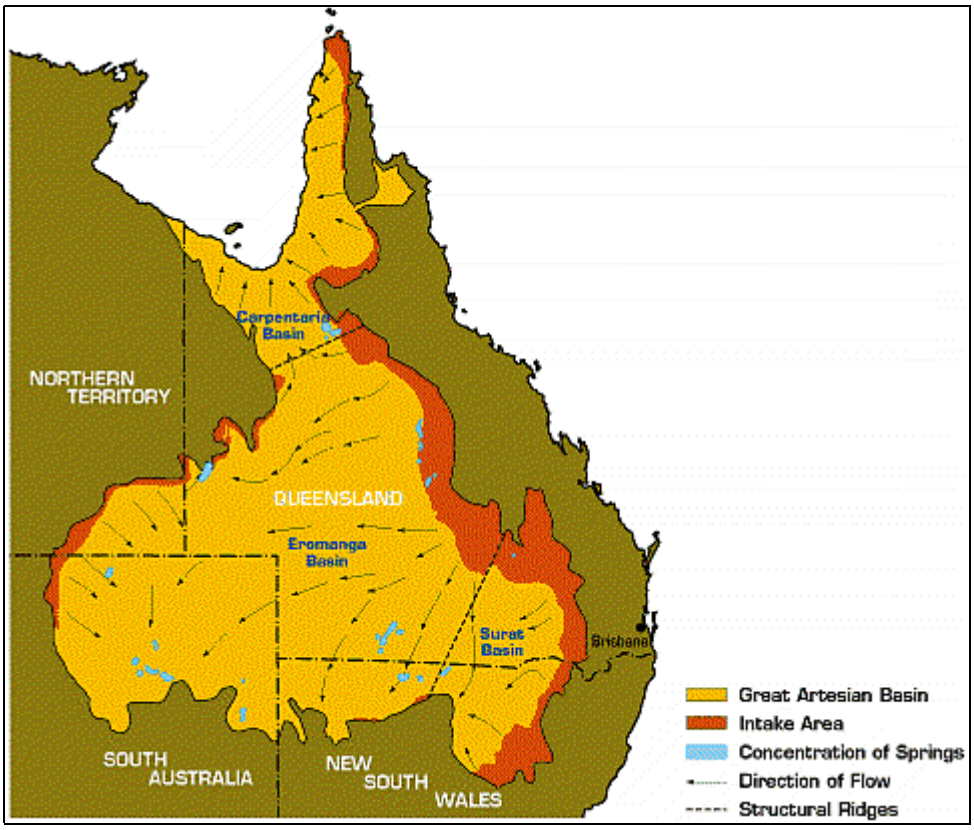
Managing groundwater basins cooperatively

The Great Artesian Basin is the largest artesian groundwater basin in the world. It underlies approximately one-fifth of Australia and extends beneath the arid and semi-arid parts of Queensland, New South Wales, South Australia and the Northern Territory, stretching from the Great Dividing Range to the Lake Eyre depression. The Basin covers a total area of over

1 711 000 square km and it has an estimated total water storage of 8 700 million megalitres (a megalitre is one million litres and is equivalent to about half the water in an Olympic swimming pool).

Many bores initially flowed at rates of over 10 megalitres per day. However, the majority of flows are now flowing between 10 000 litres and six megalitres per day. Total flow from the Basin reached a peak of over 2 000 megalitres per day around 1915, from approximately 1 500 bores. Since then, artesian pressure and water discharge rates have declined, while the number of bores has increased. The total flow from the basin during 1995 was in the order of 1 200 megalitres per day.

Figure 1: Great Artesian Basin



Source: www.gab.org.au (accessed July 2001)

The Great Artesian Basin Strategic Management Plan is a good example of a cooperative approach to managing groundwater resources. This plan was released in September 2000 after agreement by the Commonwealth, New South Wales, South Australia and Northern Territory Governments.

The plan proposes the following strategies to address basin management issues:

- a commitment to resource management partnerships to accelerate change;
- programs to encourage and achieve agreed understanding of the worth of the water resource;

- expanded infrastructure renewal programs, underpinned by public investments to:
  - stimulate private investments to minimise water losses and wastage; and
  - provide a platform for further investments in meeting environmental, social and economic objectives;
- changes to institutional arrangements and water entitlement systems to provide security of access to water (including water supply to priority groundwater-dependent ecosystems). Opportunities for new higher-value uses and clear responsibility for maintaining bore and reticulation systems maintenance;
- promotion of the socio-economic, environmental and heritage values of the basin;
- an emphasis on the need to sustain commitments to infrastructure renewal, maintenance and improved management;
- programs to improve knowledge and the technology underpinning improved management; and
- monitoring and evaluation to assess progress towards specific natural resource management outcomes sought through the plan.

These strategies provide guidance for governments, water users and other stakeholders on policies, programs and actions necessary to attain optimum economic, environmental and social benefits from the existence and use of basin groundwater resources.

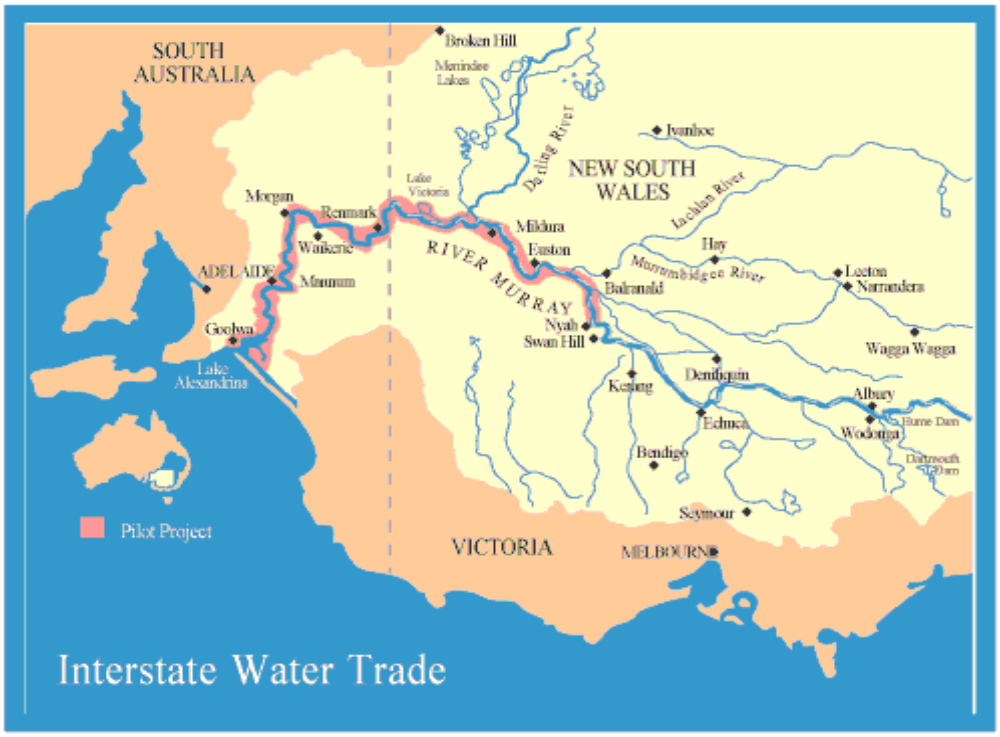
This Great Artesian Basin Strategic Management Plan is expected to be implemented over the next 15 years at a cost of $286 million.

Interstate Trading

The CoAG water agreements explicitly recognise interstate trading as an important component of water reform. This view is reinforced by the observations made by the CSIRO that while '..intrastate trading is driving the market for water, interstate trading arrangements are keeping the various markets in place.' (CSIRO 2000, p.2)

The Murray-Darling Basin Commission's Pilot Interstate Water Trading Project was established to promote interstate water trading within the basin. The objective of the pilot is to facilitate and promote interstate trade of high-security water in the Mallee region of South Australia, Victoria and New South Wales as shown in figure 2.

Figure 2: The pilot interstate water trading project area



Source: CSIRO (2000)

The pilot, in operation since 1998, has resulted in:

- the increased value of water use in the basin by allowing water to move to higher value uses;
- the expansion of the number of traders able to participate in the water trading marketplace by allowing permanent trade to occur across State boundaries; and
- the movement of water out of degraded or areas of high environmental risk. (CSIRO 2000)

The Murray-Darling Basin Commission keeps a register of all transfers and calculates exchange rates for each trade. It must also assess each trade on the basis of any environmental damage it may cause and the physical capability of the system to deliver the water. The exchange rates are designed to account for transmission system losses in the river channel and for changes in the level of water supply security. The security can fall in response to the decreased ability to retain water within storages as the water moves upstream.

According to the review, the pilot enabled 51 trades — accounting for more than 9.3 gigalitres — between 1998 and September 2000. The total value of these trades was more than $9.9 million, with three trades individually worth more than $1 million. More than 90 per cent of the water traded (more than 8.8 gigalites) was transferred to South Australia.

The pilot was assessed in a two-year review of interstate trading (reported by the MDBC 2000). The review examined the net effect of the pilot and noted areas where progress or improvement could be made. The review findings included:

- that arrangements for interstate trade are improving;
- that administrative arrangements are an impediment to efficient trade and need to be streamlined;
- that interstate trading is increasing the value of water use in the Murray-Darling Basin;
- that interstate trade has had no measurable adverse social impact during the pilot;
- that environmental impacts are mixed. The environmental flow impact has probably been positive, while the salinity impact is expected to be negative;
- that exchange rates are poorly understood; and
- that mechanisms for enforcement need to be improved.

While going a long way to promote interstate trade, the Murray-Darling Basin Commission trial is restricted in both the area covered and the type of water rights that can be traded. Consequently, there are three issues governments will need to focus on in the future.

First, different types of water property rights exist within the basin. In some instances, inconsistent property rights could impeded interstate trade. A consistent approach to the key components of property rights, for example, security of tenure and security of water — is needed. Also needed is an exploration of opportunities to better define and specify the water property rights across the basin and to improve the exchange rate arrangements to reflect fully the extent of overallocation, security of tenure and the salinity impact. The Council notes the effort of the Murray-Darling Basin Commission in attempting to resolve some of these issues. In the 2002 NCP assessment, the Council will review the progress made in addressing concerns about property rights and, where relevant, check whether all jurisdictions have cooperated to resolve difficulties.

Second, the broader environmental impacts of trading will depend on the degree to which individual States set and enforce irrigation and drainage plans. The Murray-Darling Basin Commission and the member States need to consider further the best means by which to address environmental impacts of interstate trade.

Third, as the previous two issues are addressed, consideration needs to be given to expanding the pilot both in the area covered, and the types of licences that can be traded. For example, consideration is currently being given to the

creation of a second pilot zone between New South Wales and Queensland in the Border Rivers catchment.

Restoration of the Snowy River

The Snowy River is an Australian icon which has been degraded over the last 50 years as a result of the Snowy Mountains Hydro-electric Scheme. Its cultural, social and environmental values to the Australian community are immense and thus Governments have agreed that it is the top priority for restoration. The Victorian, New South Wales and Commonwealth Governments have agreed to restore this river with a combination of flow improvements generated by water saving projects and habitat improvements. The three governments have agreed to provide $375 million over 10 years to achieve this.

National Benchmarking

States and Territories have established a national process to extend inter-agency comparisons and benchmarking. Benchmarking systems are in place for the non-metropolitan urban and rural sectors, *WSAA Facts* is to be used to benchmark major urban service providers.

All States and Territories are participating in benchmarking projects.

The Water Services Association of Australia has been benchmarking major urban water service providers for 6 years. The most recent report covers 1999-2000 data. *WSAA Facts* (2000) covers 21 water businesses and provides information on:

- customer profiles and water volumes;
- service performance including, health, environment, service delivery and pricing;
- infrastructure; and
- economic and financial performance.

For the non-metropolitan urban sector, a report is compiled by the Australian Water Association under the direction of the Non Major Urban Water Utilities Working Group. The second national benchmarking report for the non-metropolitan urban service providers covered 1998-99 data and was released early in 2000. The report provides information covering 67 utilities from all States and the Northern Territory. It includes information on:

- customer and utility profiles;
- prices and revenues;

- energy consumption for water supply and environment (for waste water);
- levels of service;
- operating costs; and
- whole of business performance summary.

In total the non-metropolitan urban and *WSAA Facts* benchmarking reports cover water services to 83 per cent of the Australian population.

For rural schemes the second industry benchmarking report, covering 1998-99 data was prepared by the Australian National Committee on Irrigation and Drainage and released in February 2000. The report provides comparisons of performance in four key areas:

- systems operation;
- environmental issues;
- business processes; and
- financial aspects.

The Australian National Committee on Irrigation and Drainage is continuing to improve and refine their approach to benchmarking. The report notes, however, that data collection and reporting processes are still being developed and, therefore, this limits the ability to compare information between the 1997-98 and 1998-99 reports. It appears that the industry has a strong commitment to this project, as there was a 40 per cent increase in the number of rural service providers participating in the rural benchmarking project.

National Land and Water Resources Audit

The audit is a program of the Natural Heritage Trust. It was set up in 1997 to help improve decision-making on land and water resource management in Australia. In 2000, the fourth water resources assessment was undertaken in partnership with Commonwealth, State and Territory agencies.

The national audit provides summary information at national, State and Territory and surface water basin and groundwater management unit levels. It also identifies gaps and monitoring requirements which need to be addressed in order to make more effective water resource management decisions.

The key outputs of the water resources audit are to better define Australia's surface and groundwater management areas. The audit also attempted to quantify the amount of water being used and how it is being used and allocated.

The audit found that:

- of Australia's surface water resources, 84 of 325 basins (25 per cent) are either fully allocated or overallocated in terms of sustainable flow regimes. Of the 325 surface water basins, 44 have formal allocations for the environment;

- of Australia's groundwater resources, 161 of 538 groundwater management areas are either fully allocated or overallocated in terms of the sustainable yield assessments;

- water use efficiency, recycling, trading and pricing are increasingly becoming priorities and provide opportunities for development. To support this shift in development emphasis, improved information on water use is essential;

- water availability is at the centre of economic development and environmental management; and

- it is essential that Australia capitalise on the data collection investment of States and Territories and the audit and put in place Australia wide assessment and reporting systems.

The National Land and Water Resources Audit also produced a *Dryland Salinity Assessment 2000* in collaboration with the States and Territories which defines the distribution and impacts of dryland salinity across Australia.

The dryland salinity assessment concluded:

- approximately 5.7 million hectares of Australia are within regions mapped to be at risk or affected by dryland salinity. It has been estimated that in 50 years time the area of regions with a high risk may increase to 17 million hectares (three times as much as now);

- some 20 000 kms of major road and 1600 kms of railways occur in regions mapped as high risk. Estimates suggest these could be 52 000 kms and 3600 kms respectively by 2050;

- salt is transported by water. Up to 20 000 kms of streams could be significantly salt affected by 2050;

- Areas of native vegetation (630 000 hectares) and associated ecosystems are within regions with areas mapped to be at risk. These areas are projected to increase by up to 2 000 000 hectares over the next 50 years; and

- Australian rural towns are not immune: over 200 towns could suffer damage to infrastructure and other community assets from dryland salinity by 2050.

National Action Plan for Salinity and Water Quality

On 3 November 2000, CoAG endorsed the Commonwealth's proposal for an action plan to address salinity, particularly dryland salinity, and deteriorating water quality issues. These issues are of major national significance and are appropriately handled through a national action plan.

Salinity and deteriorating water quality are seriously affecting the sustainability of Australia's agricultural production, the conservation of biological diversity and the viability of our infrastructure and regional communities. At least five per cent of cultivated land is now affected by dryland salinity – this could rise as high as 22 per cent. One third of Australian rivers are in extremely poor condition, and land and water degradation, excluding weeds and pests, currently costs approximately $3.5 billion per year.

The Action Plan builds on the achievements of the Natural Heritage Trust, initiatives by individual State and Territory governments, the CoAG water reforms, and the work of the Murray-Darling Basin Commission.

The goal of the Action Plan is to motivate and enable regional communities to use coordinated and targeted action to:

- prevent, stabilise and start to reverse trends in dryland salinity affecting the sustainability of production, the conservation of biological diversity and the viability of our infrastructure; and

- improve water quality and secure reliable allocations for human uses, industry and the environment.

The national Action Plan will involve six elements, all of which are necessary to achieve lasting improvements over dryland salinity and deteriorating water quality:

1. targets and standards for salinity, water quality and associated water flows, and stream and terrestrial biodiversity agreed either bilaterally or multilaterally, as appropriate;

2. integrated catchment/regional management plans developed by the community and accredited jointly by Governments, in the 20 agreed catchments/regions that are highly affected by salinity, particularly dryland salinity, and deteriorating water quality;

3. capacity building for communities and landholders to assist them to develop and implement integrated catchment/region plans, together with the provision of technical and scientific support and engineering innovations;

4. an improved governance framework to secure the Commonwealth, State and Territory investments and community action in the long term: including property rights; pricing; and regulatory reforms for water and land use;

5. clearly articulated roles for the Commonwealth, State, Territory, local government and community to provide an effective, integrated and coherent framework to deliver and monitor implementation of the action plan; and

6. a public communication program to support widespread understanding of all aspects of the action plan so as to promote behavioural change and community support.

The action plan involves new expenditure by Commonwealth, State and Territory governments of $1.4 billion over the next seven years. The Commonwealth's financial contribution of $700 million for regional implementation of the action plan will be matched by new State and Territory financial contributions.

CoAG agreed that compensation to assist adjustment where property rights are lost will need to be addressed in developing catchment plans. While any such compensation is the responsibility of the States and Territories, the Commonwealth is prepared to consider making an additional contribution, separate from the $700 million announced to implement the action plan.

National Objectives for Biodiversity Conservation

In June 2001, the Commonwealth, New South Wales, Victoria, South Australia, Western Australia and the ACT endorsed an overarching policy document that sets targets and objectives for national biodiversity conservation in Australia.

The objectives cover such areas as:

- protection and restoration of native vegetation and terrestrial ecosystems;
- freshwater ecosystems, marine and estuarine ecosystems;
- control of invasive species;
- integration of measures for dryland salinity;
- promotion of ecological sustainable grazing;
- minimisation of the impact of climate change on biodiversity;
- maintenance of the biological knowledge held by indigenous people;

- improvement in scientific knowledge and access to scientific information; and

- introduction of institutional reform in integrated regional management and review and remove any legislative impediments to biodiversity conservation.

High Level Steering Group

The High Level Steering Group on Water provides a good example of intergovernmental cooperation in water reform. The group is set up under the Agriculture and Resource Management Council of Australia and New Zealand and comprises representatives of the agriculture and environment agencies of the Commonwealth and Australian State Governments.

This group's role is to help maintain the impetus of the CoAG water reforms, by reporting to the Agriculture and Resource Management Council of Australia and New Zealand and the Australian and New Zealand Environment and Conservation Council on progress in implementing reform. Importantly, the High Level Steering Group is also involved in valuable work to assist in implementation of the water reforms. This has included commissioning research on key reform issues such as costing and charges for externalities, establishing a consistent national approach to water trading, institutional approaches to water resource management, water for the environment and opportunities for improved management of groundwater. It is intended that, once finalised, these papers will be available on the Commonwealth Department of Agriculture Fisheries and Forestry website.

The Council's approach to assessing progress

The Council's approach to assessing the water component of the 2001 NCP assessment has recognised the complexity of the issues and the level of detail and breadth of the agreements. This assessment needs to accommodate the fact that each State and Territory faces different problems and has started with different sets of environmental and institutional characteristics.

The Council based its 2001 assessment on information provided by State and Territory Governments, its own research, and other reports including:

- The Australian Urban Water Industry (WSAA Facts);

- The National Land and Water Resource Audit Assessment of Water Resources 2000; and

- work by the High Level Steering Group on Water.

Stakeholders have also had a substantial input into this assessment. The Council received 10 submissions from irrigators and environmental groups. None of these submissions questioned the need for reform, or the underlying objectives of the water agreements. Generally, the submissions discussed the process and speed of reform and which aspects of the reform package should be given priority. However, there is universal recognition that appropriate water reforms are fundamental to Australia's future.

To facilitate a broad understanding of the Council's approach and to enable interested stakeholders to provide submissions the Council released a framework for the 2001 NCP assessment in February 2001.

The CoAG water reform agreements generally provide very broad descriptions of the water reform obligations. Because of this, the framework developed a more detailed explanation and interpretation of the water reform obligations. The framework did not redefine the commitments determined by CoAG, rather it's aim was to:

- provide a clear, transparent basis for assessment particularly in relation to matters considered in previous assessments;

- identify the type of information that jurisdictions should provide to demonstrate compliance; and

- provide a basis for early identification and bilateral discussion of areas where achieving reform outcomes is proving difficult.

The assessment framework is at appendix A to this document.

To further assist informed debate the Council also released seven discussion papers (see box 1). The discussion papers are available on the Council's website.

In this report the Council has provided comprehensive coverage of the water reform assessment issues identifying current and future issues and providing sufficient information to inform stakeholders of the reasons for the assessment.

Box 1: Background information papers on water reform commitments

Rural water pricing - covers full cost recovery in the rural sector including CSOs and positive rates of return.

New investment in rural water infrastructure - discusses a methodology to assess the economic viability and ecological sustainability of new investments in this area.

Institutional reform issues in the water industry - discusses why regulation is important and examines the potential for conflicts of interest between regulation and service provision and arrangements to deal with these.

Environmental requirements of the CoAG Water Reforms (paper prepared with the assistance of Environment Australia) - outlines the national agreements on the environment that may be useful as a guide in reporting progress against the environmental requirements of the water framework.

Implementing the National Water Quality Management Strategy (paper prepared by Environment Australia and the Department of Agriculture Fisheries and Forestry Australia in consultation with State and Territory government agencies) - the Commonwealth, after consultation with States and Territories, has proposed that implementation of the guidelines should be assessed through a two yearly review process. This paper provides a list of the component modules of the National Water Quality Management Strategy guidelines and their current status. The Council will be looking to jurisdictions to show how the guideline principles have been adopted in the 2001 NCP assessment and subsequent assessments.

Defining water property rights - discusses the specification of water property rights so as to promote efficient and sustainable investment and trade.

Water reform and legislation review - outlines the status of legislation reviews of relevant water legislation for each jurisdiction based on a stocktake report conducted by Marsden Jacob consultants.

South Australia

The Murray River is South Australia's primary source of water. It also provides water to metropolitan Adelaide and South Australian country towns. Ground water is an important source of water for the Adelaide plains (supplying vegetable and wine grape growers) and the southeast corner of the state around Mt Gambier, Eyre Peninsula and the Murray Mallee. The Great Artesian Basin extends into the northern part of South Australia.

The South Australian Water Corporation (SA Water) is the state's major water service provider. It is a corporatised entity that is responsible for the provision of urban and rural water and wastewater services. SA Water has outsourced water supply and wastewater services in Adelaide. The Minister for Government Enterprises is responsible for water services legislation, including SA Water. The Minister for Water Resources is responsible for most water matters including water resource management.

Rural water use in South Australia is dominated by irrigated agriculture. Irrigated agriculture accounts for around 80 per cent of total water use in the state.

Progress on reforms

Pricing and cost recovery

Urban water services

In South Australia, water charges for commercial and non-commercial customers are based on different pricing structures. Recent reforms have made customer payments more responsive to the volume of water used. The Council notes the sound financial performance of SA Water and commends efforts to improve service quality and the overall efficiency. The Council also notes the measures taken by South Australia to take account of the cost of environmental externalities associated with water use.

The Council is concerned about the high and increasing proportion of profits being returned by SA Water to the government as dividends. The Water Services Association of Australia reported SA Water's dividend pay out ratios of 119 per cent and 124 per cent in 1998-99 and 1999-2000 respectively (WSAA 2000). The 1999-2000 figure was the highest among Australia's large

metropolitan services. The Council notes that if continuation of this policy was to lead to insufficient funds being retained within the business to fund initiatives such as future investment in water supply, this potentially raises an issue for future NCP assessments. The Council will review this matter in future assessments to ensure that SA Water's dividend policy is consistent with CoAG guidelines.

South Australia has indicated its commitment to implement a package of reforms that will remove free water allowances from commercial water pricing via a phased introduction of user charges (through amending the *Waterworks Act 1932*) by December 2001. It has also indicated its commitment a broader-based trade waste charge regime from 2002-03. The Council will look for evidence of progress with introducing the new arrangements for commercial water prices and trade waste charges.

South Australia has initiated reform processes that will reduce the potential for non-transparent cross subsidies in the urban water sector. The Council will continue to monitor the progress of these in future assessments.

Rural water services

South Australia has advised that all irrigation schemes are recovering the lower bound of the CoAG pricing guidelines. The costs of externalities in prescribed areas are covered through levies charged by the Catchment Water Management Boards. South Australia has also advised that no community service obligation (CSO) payments have been made to privately managed irrigation schemes. The Council will look for further evidence of compliance with CoAG cost recovery requirements including provisions for taxes or tax-equivalents by irrigation schemes in the 2002 assessment.

There have been proposals for the supply of additional irrigation water to areas such as the Barossa Valley and Clare Valley. The Council is satisfied that, if these proposals proceed, they will be on an economically viable basis. There are also proposals to rehabilitate the Loxton and Lower Murray irrigation areas. The Council will look for evidence demonstrating the ecological sustainability of the Barossa Valley, Clare Valley, and the Loxton and Lower Murray irrigation areas in future assessments.

The Council is satisfied that for the 2001 NCP assessment South Australia has complied with water pricing and cost recovery commitments.

Institutional reform

The recently released State Water Plan 2000 outlines South Australia's approach to further enhancing the structural separation of water resource management, service provision, standard setting and regulation. The Plan clarifies and improves transparency in water management and

environmental regulation, expands the number of catchment water management boards and identifies strategies to work with stakeholders such as the local governments and the Murray–Darling Basin Commission.

Following a 1999 confidential review of water and wastewater pricing options by the South Australian Government, some approaches to pricing have been announced. However, the Council has significant concerns about the transparency of water price setting in South Australia. This lack of transparency makes it impossible for the Council to be confident that pricing decisions will be based consistently on the principles set out in the water agreements. Moving to a more transparent approach to price setting and monitoring would remove the need for the Council to be closely involved in price related assessments in the future. The Council will continue to look for progress in resolving the issue of a commitment from the South Australian Government to implement a more transparent approach to price regulation for the water industry.

SA Water is continuing to participate in the Water Services Association of Australia performance monitoring process. In addition South Australia has undertaken a series of irrigation benchmarking projects across a number of regions in the state.

South Australia is continuing to devolve the responsibility of irrigation management to local bodies supported by the irrigators. The Loxton Irrigation District is one of the last major irrigation areas to be converted to self-management in July 2001. The transfer of irrigation districts in the Lower Murray reclaimed irrigation area is also being discussed. The Council will review the progress of the devolution process in the 2002 assessment.

The Council is satisfied that South Australia has complied with institutional reform commitments for this assessment. It will continue to address the issue of independent prices oversight with South Australia for future assessments.

Allocation and trading

Water allocation

The *Water Resources Act 1997* provides the framework for an effective allocation system for prescribed water resources in South Australia. The framework consists of water allocation plans, local water management plans and regional catchment water management plans. Water allocation plans are the main tool for the allocation of water to the environment and other users.

Water allocation plans have now been prepared for all licensed water use in the 16 prescribed water resource areas in the state. Consequently, South Australia is ahead of a number of other jurisdictions in finalising a sizeable number of robust allocation plans. The Council notes that further research

will be required before environmental needs will actually be implemented in the case of several of the plans.

The Council is concerned about the level of farm dam development in some areas of South Australia and the potential impact on environmental flows. South Australia has recognised this issue and is implementing measures to address the concern. The Council will monitor the farm dams issue in future assessments.

The current knowledge of environmental water needs and definitions of stressed resources are key areas that South Australia has identified the need to improve. South Australia proposed to commence the 'Stressed Resources Assessment Review' to examine these issues during 2001. The Council will look at the outcome of this review in the 2002 assessment.

Water trading

Water rights are issued to water users in prescribed areas through licences issued under the *Water Resources Act 1997*. Water trading is possible in any prescribed area where licences have been issued. There are rules for trade in each of the water allocation plans that have been completed.

South Australia has dominated interstate trade, with more than 90 per cent of water being traded to the state. Scarcity of additional allocations of water, combined with the growing demand from industries such as viticulture, has created a strong demand for water trading in South Australia.

The increased water use has the potential to contribute to an increase in salinity in South Australia. In order to address this issue, South Australia is currently implementing a specific water licensing condition for approval to use all traded water. This specific condition requires water users to complete Irrigation and Drainage Management Plan and a Salinity Prevention Obligation to manage the salinity impacts.

The Council is satisfied that South Australia has made satisfactory progress in water allocation and trading reform commitments for the 2001 assessment. The Council will continue to monitor the efficacy of the trading arrangements in future assessments.

Environment and water quality

The South Australian Government is currently reviewing the institutional arrangements to deliver integrated natural resource management. A draft Bill has been released for public comment. The Council has reviewed the draft Bill and is satisfied with it.

South Australia is implementing the integrated catchment water management plans through the eight catchment water management boards,

which cover 95 per cent of the State. South Australia is also proposing to review the operation of the catchment management planning process as a part of the review of the *Water Resources Act 1997* in 2002 to clarify and refine the existing frameworks.

There is an ongoing commitment in South Australia to a coordinated approach to water quality management including the implementation of the National Water Quality Management Strategy. However the Council is concerned about the slow pace of finalisation of the draft Environment Protection (Water Quality) Policy to implement the national strategy. The Council will continue to monitor this issue and would expect the draft Policy to be implemented before the 2002 assessment.

The Council is satisfied that South Australia has complied with environment and water quality reform commitments.

Consultation and education

South Australia continues to consult the community through significant programs and communication strategies accompanying all major water reform initiatives. For example, South Australia undertook extensive communication and education before the release of the State Water Plan 2000 in September 2000.

State Government agencies and community-based bodies, including catchment water management boards, are undertaking a range of important initiatives to raise community awareness on sustainable water resources management and use. The devolution of a range of water management responsibilities to catchment water management boards has significantly enhanced the level of community awareness of water and wastewater as a valuable resource. Each of the boards allocates a significant proportion of their budget to community education and awareness.

South Australia continues to participate in national initiatives such as Waterwatch and National Water Week. Waterwatch has been increased to 13 regional programs to reach more community groups and students in South Australia's key catchments.

As discussed earlier, the Council continues to have concerns with the level of transparency and consultation in water pricing and this will be examined further in future NCP assessments. The Council has reviewed the information provided by South Australia and believes the development of the water allocation plans and catchment water management plans have been subject to considerable consultation. The Council is satisfied that South Australia has complied with public education and consultation reform commitments.

Assessment

The Council is satisfied that South Australia has met reform commitments required for the 2001 assessment. The Council acknowledges the substantial degree of commitment and progress of water reforms in the State. The Council will revisit again the issue of the need for more transparent price setting in the 2002 assessment.

Pricing and cost recovery: urban

Governments have agreed that urban, non-metropolitan urban and rural water services should introduce full cost recovery and consumption based pricing and identify and report CSOs and cross-subsides (clause 3).

SA Water is the State's primary supplier of water and wastewater services to metropolitan areas (such as Adelaide) and non-metropolitan areas (such as country towns). In 1999-2000, SA Water supplied water services to over 600 000 customers (or connections) or nearly 1.5 million people, utilising assets valued at around $6 billion. Wastewater services were provided to over 1.1 million people (see Table 1). Consistent with the State's population distribution, most services are provided to the Adelaide metropolitan area.

Table 1: Properties and population served by SA Water, 1999-2000

	Population served	*Number of connected properties*[a]
Water		
Metropolitan	1 050 000	453 589
Non-metropolitan	415 000	171 987
Total	**1 465 000**	**625 576**
Wastewater		
Metropolitan	1 029 000	431 000
Non-metropolitan	141 200	58 347
Total	**1 170 200**	**489 347**

[a]Number of connected properties is based on account numbers.

Source: SA Water (2000), South Australia (2001a)

The South Australian Government has adopted a uniform price policy that results in all urban customers within a particular class paying the same price for water and wastewater services, regardless of the cost of delivery. However, recent reforms have made water bills more responsive to the volume of water used.

Local governments provide urban storm water services and are also responsible for over 90 septic tank effluent disposal schemes in country towns. The costs of storm water services are recovered through local government rates. Charges for septic tank effluent disposal schemes vary across local governments. People not covered by the above arrangements must rely on private arrangements; for example rainwater tanks and bores septic tanks.

Full cost recovery

Governments have agreed to set prices so that water and wastewater businesses earn sufficient revenue to ensure their ongoing commercial viability but to avoid monopoly returns. To this end governments agreed that prices should be set by a jurisdictional regulator (or its equivalent) to recover:

- at most the operational, maintenance and administrative costs, externalities, taxes or tax equivalent regimes, provision for the cost of asset consumption and cost of capital, the latter being calculated using a weighted average cost of capital; and
- at least, the operational, maintenance and administrative costs, externalities, taxes or tax equivalents (not including income tax), the interest cost on debt, dividends (if any) and make provision for future asset refurbishment/replacement. Dividends should be set at a level that reflects commercial realities and stimulates a competitive market outcome.

Asset values should be based on the deprival methodology unless an alternative approach can be justified and an annuity approach should be used to determine medium to long term cash requirements for asset replacement/refurbishment. Governments can still provide assistance to special needs groups through community service obligations but this should be done in a transparent way (clauses 3a, b and c).

SA arrangements

Commercial viability

In spite of an increase in expenditure, SA Water's profit before tax equivalent payments in 1999-2000 reached a record $196.6 million, which was a 9.3 per cent increase on the 1998-99 result. SA Water (2000) noted this was due to a 4.4 per cent increase in water and wastewater revenue higher levels of activity in the building sector prior to the introduction of the goods and services tax, efficiencies generated by management, and additional CSO funding of $8.1 million.

Table 2: Financial performance by business, 1999-2000

		Metro Water	*Non Metro*	*Metro Sewer*	*Non Metro*	*Other*	*Total*
Operating Revenue							
Rates and charges		177 043	76 072	171 717	20 282	-	445 114
Community service obligations		1 529	67 510	5 266	10 434	520	85 259
Contributed assets		10 689	3 259	18 779	2 230	-	34 957
Other revenue		9 254	6 015	6 594	1 178	16 281	39 322
Total operating revenue		*198 515*	*152 856*	*202 356*	*34 124*	*16 801*	*604 652*
Operating Expenses							
Operations and services		69 413	50 340	48 560	10 743	21 660	200 716
Depreciation and amortisation		33 519	32 148	29 927	6 152	20	101 766
Borrowing costs		27 371	36 348	24 550	4 548	2	92 819
Total operating expenses		*130 303*	*118 836*	*103 037*	*21 443*	*21 682*	*395 301*
Expenditure on behalf of State Government		1 795	769	-	-	1 455	4 019
Total expenditure		*132 098*	*119 605*	*103 037*	*21 443*	*23 137*	*399 320*
Operating profit/(loss) before tax		*66 417*	*33 251*	*99 319*	*12 681*	*(6 336)*	*205 332*
Unallocated items:							
Abnormal items							(8 776)
Operating profit after abnormal items							196 556
Income tax equivalent							(54 706)
Operating profit after abnormal items and income tax							141 850
ASSETS	$ Billions	1.9	1.8	1.7	0.3	0.2	5.9
Return on assets	**per cent**	**4.9**	**3.9**	**7.3**	**5.4**	**-3.2**	5.1

Note: Assets for the 'Other' segment include computer hardware and software, depots and minor plant. Revenues and expenses for the 'Other' segment include revenues and expenses associated with the Murray—Darling Basin Commission, the Australian Water Quality Centre, engineering workshops and water industry business development

Source: SA Water (2000)

Taxes

SA Water's 2000 annual report notes that the Corporation is subject to tax equivalents for income taxes, sales tax, land tax and local government rates. In 1999-2000 SA Water made tax equivalent payments of $54.7 million compared to $55.8 million for the previous year.

Externalities

Information provided by South Australia noted that to cover the costs of externalities, the Catchment Water Management Boards charge for the costs of works through a land based or water based levy. The Council also understands that the South Australian Water Corporation contributes a

minimum of 0.5 cents per kilolitre to each of the relevant Catchment Water Management Boards in the form of ex-gratia payments for water extracted in the board's area. South Australia argued that this provides an environmental externality to the cost of all reticulated water supplies (see section on rural water pricing).

Assets

The SA Water 2000 annual report states that the optimised deprival value method is used to value infrastructure, land, plant and equipment. Water sewer mains and water meters are valued predominantly on current contract rates. Other infrastructure asset values were based on the current cost of replacing the asset or the modern equivalent asset where exact replacement would not be appropriate. Land and buildings are based on independent valuations with the last such valuation carried out as at 1 July 1999. Plant and equipment are recorded at depreciated historic cost.

Depreciation is used to account for asset consumption. Infrastructure assets buildings, plant and equipment are depreciated using the straight-line methodology over useful lives reported as ranging from 5 to 160 years. The SA Water annual report notes that:

> *The method of depreciation has proper regard to current understanding of the underlying nature of the assets and their expected use in the operations of the corporation.* (SA Water 2000, p.47)

Detailed asset management plans are developed for urban and country assets. Progress against these plans is discussed in the SA Water 2000 annual report.

Rate of return

In 1999-2000, SA Water's water and wastewater services to both urban and non-metropolitan areas earned a positive return on assets once CSOs were taken into account (see Table 2). SA Water's recorded before tax earnings translated into a return on assets of around five per cent. This is slightly higher than the preceding year, and compares with a medium term target return of six per cent and a weighed average cost of capital of eight per cent (SA Water 2000, NCC 1999)

The Water Services Association of Australia (2000) reported an economic real rate of return for 1999-2000 of 6.13 per cent for SA Water compared to the national trend of 5 per cent. For water supply and wastewater separately economic rates of return of 4.95 per cent and 7.48 per cent were reported respectively and can be compared to national trends of 5 per cent and 5.16 per cent for water and wastewater services (WSAA 2000). SA Water's return on wastewater is the third highest among large metropolitan service

providers participating in the Water Services Association of Australia benchmarking survey.

Dividends

SA Water paid dividends of $175.5 million in 1999-2000, representing 90 per cent of earnings before interest and tax. This compares to dividends of $144.4 million the previous year (80 per cent of earnings before interest and tax). The Water Services Association at Australia reported SA Water's dividend payments as the highest among the Country's large metropolitan services.

Discussion

The Council's second tranche assessment recommended that SA Water overall was earning a return within the bounds defined by the CoAG guidelines. The second tranche assessment also noted the varied returns earned by metropolitan and country activities and that the State's uniform price policy meant that, on their own, non-metropolitan returns did not cover the cost of providing services. However, given that a transparent CSO was used to ensure the viability of these activities, the Council was satisfied that second tranche NCP commitments were met. In undertaking its 2001 NCP assessment the Council again notes the sound financial performance of SA Water and commends efforts to improve service quality and efficiency.

However, the Council is concerned to ensure that the increasing proportion of profits being returned to the Government as dividends does not limit the funds being retained within the business for future investment to maintain or enhance service levels or environmental standards.

The CoAG guidelines require that dividends where provided reflect 'commercial realities and stimulate a competitive market outcome'. South Australia have confirmed that that SA Water's dividend payments to the Government is currently 59 per cent of earnings before interest, tax, depreciation, and amortisation including repayment of an amount equal to the CSO for non-metropolitan water services (currently $75 million). South Australia has advised that a target rate of 55 per cent of earnings before interest, tax, depreciation and amortisation less 'stay in business capital' has been agreed and will apply from 2001-02. The Council will review this matter in future assessments to ensure that South Australia's dividend policy is consistent with the CoAG guidelines.

In relation to provision for externalities the 1999 discussion paper on water pricing prepared by the State Government and SA Water noted that:

> *… where the taking of water gives rise to environmental costs, or the costs of avoiding damage, these are costs that should be paid for. Where costly management of the basic resource has identifiable*

> *benefits that can be sheeted home to urban and country stock and domestic users as a group, a case can be argued that these should be paid for through water charges rather than through taxes.* (SA Water 1999, p. viii)

The environmental costs of water should be considered when setting prices as far as possible. The Council suggests that the water-based levies provide an acceptable tool in addressing the issue externalities. However, in addition as noted in by High Level Steering Group on Water (2000) externalities need to be addressed using a 'portfolio of decision tools'. In addition to charging regimes these 'decision tools include well-defined property rights, subsidies and standards (see following sections).

Assessment

The Council is satisfied that urban and non-metropolitan water and wastewater services are recovering costs consistent with CoAG commitments. The Council will revisit the South Australian Government's dividend policy when it reviews progress again in 2002, to ensure consistency with CoAG commitments.

Consumption-based pricing

Governments have endorsed the principle that prices should reflect the volume of water supplied so that prices encourage more efficient water use and to give customers more control over the size of their water bill. For urban water providers using surface or groundwater, two-part tariffs (comprising a fixed access component and a volumetric cost component) are to be introduced where cost effective (clauses 3a and b).

South Australian arrangements

Retail and distribution water charges

In South Australia, water charges for commercial and non-commercial customers are based on different pricing structures. For residential customers (including homes, strata title units, vacant residential land) and 'business' customers (includes industrial, primary production, hotels and motels, and public institutions such as schools and hospitals)[1], water charges are made up of a fixed access charge and a volumetric charge. The volumetric charge increases when annual consumption exceeds 125 kilolitres (see Table 3).

[1] But excluding defined commercial customers.

Commercial water users (including wholesale, retail and financial services as well as a range of other service businesses) pay a volumetric charge but the access charge is based on improved property value with a minimum charge of $134. Further, the volumetric charge only applies once consumption is above a free water allowance equal to the access charge divided by 91 cents per kilolitre.

Table 3: SA Water charges, 2000-01.

	Residential	*Business*	*Commercial*
Access charge	$121 p.a.	$134 p.a.	$134 plus $2.05 per $1000 of improved property value above $65 400
Water usage charge			
0-125kL	36c/kL	36c/kL	91c/kL above free water allowance
>125kL	91c/kL	91c/kL	

Source: www.sawater.com.au.

In September 2000 the State Government undertook to implement the following reform package for commercial prices in addition to committing to not expand the use of property values beyond the commercial water and wastewater charges:

- free water allowances would phase out over a five year period beginning 2002-03 to result in commercial customers facing the same usage charge as other customer groups;

- free water allowances would effectively disappear in the first year as water that was previously provided free would be priced at 20 per cent of the charge faced by other users;

- the impact of the reform, other things being equal, would be revenue neutral for the commercial sector with the level of property rate applied for access being reduced to offset the increase in usage charges. The property based access charge was expected to fall by around 25 per cent; and

- over half of the State's commercial customers could expect a reduction in their water bill with the five year phase in period assisting those experiencing an increase to adjust to the change.

South Australia advised that legislative changes to the Waterworks Act are required by December 2001 to enable the 2002-03 start date, due to rolling meter reading arrangements and billing cycle. The legislation to secure the necessary amendments was introduced into Parliament on 5 July 2001 and South Australia has restated its commitment to the passage of the necessary amendments by December 2001.

Bulk water charges

SA Water is a vertically integrated service provider. However, the introduction of a financial model providing access to detailed bulk water pricing data has increased the potential for providing bulk water transportation services to external clients. South Australia noted that this model captures the full costs of water supply, segregated on a system by system basis and broken down into its bulk, treatment, distribution and retail segments.

The Council also understands that the financial model established for costing bulk water has already been used as the basis of pricing water transportation arrangements on behalf of a third party. Pricing for this customer includes a volumetric component and provides for recovery of all costs and a positive rate of return on the written-down cost of assets.

Wastewater charges

The composition of wastewater rates for levied by SA Water 1999-2000 is shown in Table 4.

Table 4: SA Water sewerage tariffs, 2000-01

	Metropolitan	*Non-metropolitan*
Tariff	0.244% of annually assessed improved property value with a minimum charge of $223	0.0307% of annually assessed improved property value with a minimum charge of $223

Note: Consistent with South Australia's universal price policy, a different rate is applied to property rates for non-metropolitan and metropolitan customers to reflect differences in property values.

Source: www.sawater.com.au.

South Australia have advised that a review of sewerage charges undertaken during 2000 indicated that it was not cost effective to apply usage charges, other than for a small group of large trade waste dischargers. The State has also chosen to continue the current policy of property based charges but has undertaken that there will be no expansion in the use of property values in water or wastewater pricing.

Trade waste

In South Australia, approximately 60 of the State's largest waste dischargers account for around 90 per cent of all trade waste. Around 7000 other registered trade waste discharges make up the remaining 10 per cent. In September 2000 South Australia advised the Council of the proposed reform of its existing selective negotiated trade waste system. This new regime is outlined in the Council's supplementary second tranche assessment (NCC 2000b, p.22).

A trade waste committee has been established to progress the reform of trade waste charges. The cost information on which the trade waste charge should be based has been researched over recent months and consultation with the major trade waste dischargers is expected to commence within the coming months. South Australia is expected to sign agreements with each customer and by the end of June 2002.

Discussion

The second tranche NCP assessment noted the substantial progress made by South Australia in introducing consumption based pricing. However, a number of significant concerns were raised including:

- the presence of free water allowances and property based access charges for commercial users;
- the use of property value based wastewater charges; and
- the absence of a comprehensive trade waste system.

South Australia have continued to progress these issues since the second tranche assessment, as illustrated in the Council's supplementary assessments of June and September 2000.

Commercial charges

South Australia is continuing to implement the reforms envisaged in the Council's supplementary assessment of September 2000, consistent with the timetables envisaged in that supplementary assessment. The Council will continue to monitor closely the implementation of these reforms.

Bulk water

In its June 2000 supplementary NCP assessment the Council found that South Australia had made sound progress towards achieving effective arrangements to identify and monitor the cost of bulk water supply. Such arrangements promote more efficient service delivery and, should the opportunity arise, facilitate efficient charges for external customers. However, the Council also noted that it would continue to monitor progress on this matter and look for evidence that SA Water has effective, volumetrically based, bulk water charging arrangements in operation as part of its 2001 NCP assessment.

The financial model developed by SA Water has assisted the development of bulk water transport charges for a third party in the Barossa Valley. This, combined with other CoAG water reforms such as interstate and intrastate trading in water rights, has delivered economic development that would not have otherwise occurred, and utilisation of otherwise surplus SA Water

transportation capacity. The Council sees this as evidence of not only the effectiveness of SA Water's bulk water arrangements but of the benefits of the interaction of the different types of reforms provided by the CoAG framework. The Council is satisfied that South Australia has met its second tranche commitments in relation to bulk water.

Wastewater

As noted in the June 2000 supplementary assessment South Australia advised that variable costs are largely limited to those associated with treatment and treatment plant augmentation and these are principally determined by pollutant loads rather than wastewater volumes. Consequently, South Australia suggests that for the residential sector and much of the non-residential sector there is limited scope for changing behaviour in response to usage charges. South Australia also suggests that, given metering all customers is not cost effective, any volumetric charge would have to be based on some proxy measure of volume rather than pollutant load.

The Council recognises that South Australia's finding that consumption based wastewater charges are not cost effective means that volumetric pricing is inappropriate. However, the Council is concerned that property values are being used as a basis for allocating costs among customers, given that this has the potential to result in non-transparent cross-subsidies which are not consistent with CoAG commitments. Further, current pricing arrangements make transparent consideration of the issue virtually impossible. The Council's concerns regarding the use of property values could be addressed through establishing a more open and transparent pricing setting process. Options include establishing an independent price regulator and/or a public price-setting process including submissions to the Government and a publicly available report (see the section on institutional reform).

Trade waste

In previous assessments of the existing trade waste system in South Australia, the Council was concerned that:

- services were being provided at below incremental cost;
- a number of significant exemptions are provided diluting the incentive for efficient use of the service; and
- where a firm paid a trade waste charge no charge was levied for water discharged below the acceptance limit essentially providing a free discharge allowance.

The Council supports the improvement in cost recovery likely to be provided by the new arrangements. The extension of charges for trade waste dischargers to all waste and not just that above acceptance limits is also

welcomed by the Council, as there is now a volumetric signal to encourage more economical use of the system. The Council also supports the initial focus on the State's largest dischargers but suggests that thought be given to the extension of the system (where cost effective) in the future.

While there are some aspects of this system that are not ideal (for example, the new arrangements will also include a number of large exemptions) and there may be a more effective ways to provide assistance to industry than through concessions that reduce the incentive to minimise waste discharge. The Council's September 2000 supplementary assessment noted that:

> *South Australia's March 2000 discussion paper on sewerage pricing noted that the combination of property values (for services below acceptance limits) and a trade waste charge may result in some customers paying very high charges. The Council has previously suggested that South Australia's concerns highlight the limitations of using property values as a mechanism for charging for water and sewage services. South Australia has dealt with this by a subsidy scheme which has increased the complexity of the issue.* (NCC 2000b, p. 24)

The Council supports the removal of the discharge allowance provided by the exemption from charges below acceptance limits. However, a capping providing discounts to the fixed charge (based on property value) could be preferable to discounts on the volumetric charge, as proposed by South Australia. While this may decrease the certainty of revenues it would avoid reducing the incentive to minimise the amount and toxicity of the waste discharged. It would also minimise any distortions arising from the use of property values.

Overall, the Council considers that the new trade waste arrangements represent a significant improvement on the existing system. South Australia have advised that precise structure of the charges and implementation program will be further refined after consultation with industry. The Council will look for evidence of further progress when it next assesses progress.

Assessment

The Council is satisfied that South Australia has met its 2001 NCP commitments in relation to consumption-based pricing. However, in conducting its next assessment the Council will look for evidence of progress with introducing the new arrangements for commercial water prices and trade waste.

Community Service Obligations

Where service deliverers are required to provide water services to classes of customers at less than full cost this cost be fully disclosed and ideally be paid to the service deliverer as a CSO. Governments have agreed that the Council would not make its own assessment of the appropriateness of any individual CSOs but would review information provided by governments in totality to ensure that these CSOs do not undermine the objectives of the agreed water reform framework (clauses 3a, b and c).

South Australian Arrangements

The second tranche NCP assessment outlined the key components of South Australia's 1996 Community Service Obligations: Policy Framework. It was noted that CSOs are negotiated through a purchase agreement between the relevant minister and SA Water. South Australia have also advised that a review of SA Water's CSOs has been conducted against the State's CSO framework.

The SA Water annual report notes that in 1999-2000 CSO payments had been negotiated with the:

- Minister for Primary Industries, Natural Resources and Regional Development for the pricing of non-metropolitan water and wastewater services; and

- Minister for Human Services for administration of payment of the pensioner concession scheme and the provision of water and wastewater concessions to exempt properties – charities (SA Water 2000).

South Australia has also advised that a CSO will be used to phase in SA Water's new trade waste arrangements so that SA Water is able to recover the avoidable costs imposed by trade waste dischargers. The Council understands that the CSO amount will be transparently reported in the SA Water annual report and will be reduced over the five-year phase in period. Any ongoing payments beyond 2006-07 will reflect any exemptions granted by the Government.

A distinctive feature of the water pricing in South Australia is the uniform price policy. As noted in the 2000 South Australia pricing review discussion paper a residential user in Adelaide pays the same total water bill for the same amount of water as a customer in Mount Gambier or Port Lincoln, but there are differences between customer classes. South Australia has addressed this shortfall through a substantial CSO, which is provided in a manner consistent with CoAG commitments.

The SA Water 2000 annual report stated that in 1999-2000 total receipts from CSO funding were $85.3 million compared to $77.1 for the previous year, and noted the Corporation also undertook expenditure on behalf of government of over $4 million in both 1998-99 and 1999-2000.

Discussion

As with the second tranche assessment, the Council is broadly satisfied that the State's CSO policy and arrangements for the provision of CSOs are consistent with CoAG Framework, based on the information provided. However, a number of matters raised in the second tranche NCP assessment remain unresolved. For example, the second tranche NCP assessment reported that SA Water also undertakes non-commercial activities that will continue to be funded from within the Corporation until transferred to other agencies (see the institutional reform section).

In regard to expenditure on behalf of government, South Australia advised that this expenditure comprised payments to:

- catchment water management boards;
- Water Industry Best Practice Program ($978 000);
- Cooperative Research Centre ($300 000); and
- Loxton Irrigation District Administration Fee ($177 000).

The payments to catchment management boards have a clear link to the SA Water commercial business and would not qualify as a CSO. The funding directed to the Cooperative Research Centre is similar. South Australia also noted that technically, the expenditure on the Water Industry Best Practice Program, focusing on development of local water industry participants, may qualify as a CSO. However, a key objective of SA Water under its Charter is to facilitate, participate in and profit from the development of a viable, export-focused vigorous water industry in South Australia. Further, the Water Industry Best Practice Program is complementary to the development of SA Water's international business and fosters a more competitive supplier base for local business. Consequently, SA Water has agreed with Treasury that a CSO would not be required.

Payment of the Loxton Irrigation District administration fee will cease after 1 July 2001 consistent with the process of moving this irrigation district to self-management.

Assessment

The Council is satisfied that South Australia has met its 2001 commitments in regard to CSOs.

Cross-subsidies

Cross-subsidies should be transparently reported and ideally removed where they are not consistent with efficient service provision and use (clauses 3a, b and c).

South Australian arrangements

South Australia's 2000 NCP Annual Report states that the Government has established a community service obligation policy to ensure that where cross-subsidies continue to exist, these are transparent. SA Water's CSOs have been reviewed against this framework and agreed CSOs are funded through explicit purchase agreements between purchasing Ministers and the Corporation.

Discussion

The Council has not been provided with details of the review of SA Water's CSOs nor any cross-subsidies identified through this process. However, the Council notes that the following actions taken by South Australia reduce the potential for non-transparent cross-subsidy:

- the phased elimination of free water allowances from commercial charges;
- phased introduction of revised trade waste arrangements;
- effective ring fencing of bulk water services; and
- ensured full CSO funding of government non-commercial objectives such as the uniform tariff and the phased introduction of the trade waste policy rather than using cross-subsides.

Assessment

Given reforms initiated by South Australia which reduce the potential for non-transparent cross-subsidises as part of their benefits and the specific review of CSOs and cross-subsidies the Council is satisfied that South Australia has met their commitments for this assessment. However, the lack of transparency in current arrangements makes an open treatment of the issue of cross-subsidies virtually impossible. Therefore, the Council will need to closely monitor South Australia's pricing arrangements in future assessments (see the institution reform section).

Pricing and cost recovery: rural

Governments have agreed that urban, non metropolitan urban and rural water services should introduce full cost recovery and consumption based pricing and identify and report CSOs and cross-subsides (clause 3).

For the purposes water pricing the Council has defined the rural supply sector to include all water supply services other than those supplied to urban customers. A broad definition has been adopted to achieve a comprehensive application of pricing reform across the water and wastewater industry. Under this definition CoAG rural water pricing commitments apply to activities such as:

- services provided by government-owned irrigation schemes and government-owned bulk water supply services to users in non-urban areas (such as private irrigation schemes, power stations or processing and mining plants); and
- setting license fees for commercial users extracting surface or groundwater using their own infrastructure.

In South Australia irrigated agriculture accounts for around 80 per cent of all water use. Other non-urban users include dryland farming (4 per cent) and mining (1 per cent). Of the water used for irrigated agriculture around 40 per cent comes from the River Murray, 50 per cent from South East groundwater and the majority of the remaining 10 per cent is extracted from smaller groundwater basins around Adelaide (South Australia 2000).

In the past the State's irrigation districts were owned and operated by the Government. However, South Australia is in the process of privatising these districts consistent with the principles outlined in Part 4 of the Irrigation Act (see the institutional reform section).

Full cost recovery

Governments have agreed to set prices so that water and wastewater businesses earn sufficient revenue to ensure their ongoing commercial viability but to avoid monopoly returns. To this end governments agreed that prices should be set by a jurisdictional regulator (or its equivalent) to recover:

- at most the operational, maintenance and administrative costs, externalities, taxes or tax equivalent regimes, provision for the cost of asset consumption and cost of capital, the latter being calculated using a weighted average cost of capital; and
- at least, the operational, maintenance and administrative costs, externalities, taxes or tax equivalents (not including income tax), the interest cost on debt, dividends (if any) and make provision for future asset refurbishment/replacement. Dividends should be set at a level that reflects commercial realities and simulates a competitive market outcome.

Asset values should be based on the deprival methodology unless an alternative approach can be justified and an annuity approach should be used to determine medium to long term cash requirements for asset replacement/refurbishment. Governments can still provide assistance to special needs groups through community service obligations but this should be done in a transparent way (clauses 3a and b).

South Australian arrangements

The South Australian State Water Plan 2000 noted the importance of full cost recovery consistent with CoAG principles citing it as one of the three key elements of growth in water use within sustainable limits. However, the State plan also noted that:

> *Water pricing should generate incentives for efficient resource use – incentives that market forces currently fail to generate of their own accord* (South Australia 2000, p. 59)

Irrigation districts

The Australian National Committee on Irrigation and Drainage released the Australian Irrigation Water Provider Benchmarking Report in 2001 (ANCID 2001), which reported cost recovery ratios for participating South Australian irrigation districts (see table 5). The report defined cost recovery as gross revenue divided by total costs excluding capital expenditure and depreciation and renewals. All districts for which data were available reported a surplus — Sunland's cost recovery ratio in particular — comparing favourably with the national average of 1.21.

Table 5: Available Cost recovery ratios for South Australia irrigation districts, 1998-99 and 1999-2000

Irrigation district	Cost recovery ratio	
	1999-2000	1998-99
Central Irrigation Trust	1.42	1.52
Golden Heights	1.38	1.40
Lower Murray	1.68	0.93
Sunlands	2.09	1.10

Note: Results for Remark Irrigation Trust and Loxton irrigation Area were not reported
Source: ANCID 2001

Importantly, the above figures do not include a number of key aspects of the agreed CoAG lower pricing bound such as the costs of asset consumption as provided for by depreciation or a renewals annuity. However, South Australia advised that all privatised irrigation districts do recover costs consistent with at least the lower bound of the CoAG pricing guidelines noting that charges include provision for asset renewal. The Council also understands that externalities are provided for via a levy (discussed below) and no CSOs are paid to privately managed irrigation schemes.

By way of illustration, the Central Irrigation Trust (South Australia's largest) 1999-2000 annual report notes that the Trust earned an adjusted total surplus of $677 000 in 1999-2000 leading to an accumulated surplus of $1 198 000. The surplus includes, among other things, provision for operations, maintenance and administration, depreciation and a catchment

environmental levy. No provision for taxes is reported. The Council notes that the Trust does not have any borrowings, and hence it does not need to account for interest charges. Two of the Central Irrigation Trust's eight districts (Kingston and Myponga) reported a deficit in 1999-2000. Although, once distributions from other districts are taken into account these scheme overall were in surplus.

Property, plant and equipment are brought to account at cost or fair values less any accumulated depreciation or amortisation. Carrying amounts are revised annually to ensure they do not exceed the recoverable amount from those assets, although cash flows used to estimate recoverable amounts are not discounted to their present value. Property plant and equipment acquired from SA Water in 1997 were included in the accounts at 'fair value' based on the deprival value supported by an independent valuation.

Asset consumption is accounted for through depreciation. All fixed assets with the exception of land and infrastructure are depreciated on a straight-line basis. Infrastructure is depreciated at a fixed amount each year plus an amount equal to the interest earned on the Asset Replacement Reserve Fund Investment. An amount equal to the depreciation charge on infrastructure is transferred to the Asset Replacement Reserve Fund Investment, which is calculated to replace the infrastructure in perpetuity based on current projections.

Licence fees

Following the passage of the Water Resources Act, South Australia reviewed its existing licence fees. This resulted in the refinement of existing charges to more closely reflect administrative costs. For example, a $13 per 1000 kilolitre charge associated with applications for the permanent transfer of a licence was replaced with a two tiered fee — a $50 non refundable application fee (representing hour of administrative effort) and a $250 charge. This later fee can be refunded if the application is withdrawn prior to the commencement of the assessment process (representing five hours of administrative effort). There is also scope for additional charges to cover the cost of any technical assessments. The two tiered charge was also extended to all other applications to vary allocations such as temporary transfers or leases of allocations.

New charges were also introduced to give effect to the provisions of the *Water Resources Act 1997*; for example, the cost of obtaining copies of documents (such as water allocation plans or catchment water management plans) and applications for placement and removal of notation on the register of water licences. Again the fees associated with these activities are based on the administrative cost. (A summary of 1999-2000 licence fees is provided in attachment 1).

Levies charged by Catchment Water Management Boards

South Australia have advised that Catchment Water Management Boards charge water-based levies to cover both increased monitoring and public awareness programs, where there is more intensive use and expenditure on management of the water resources. The levies also cover remediation projects to mitigate adverse environmental impacts.

Land based levies are raised from landholders who do not pay a water-based levy to cover the environmental externality from the incremental contribution to diffuse source pollution of each landholder. The water-based levy is generally considerably higher than the land based levy in each area.[2]

Discussion

Irrigation charges

South Australia have advised that all irrigation schemes are recovering the lower bound of the CoAG guidelines but only limited information is available to support this. Based on available information the Central Irrigation Trust does not appear to make provision for taxes. The Council will revisit this matter for all irrigation areas in its next assessment. In regard to Central Irrigation Trust asset values, the Council suggests that in applying the recoverable amount test future cash flows should be discounted to ensure that the recoverable amount is not overstated.

Other charges

Fees set by South Australia represent a reasonable approximation to the administrative cost of undertaking various activities resulting in customers paying an amount more closely reflecting the cost of services received. The same can also be said for the levies charge by catchment management boards such that those that benefit directly from the boards' activities contribute to the cost of securing these benefits.

Assessment

The Council is satisfied that South Australia has meet full cost-recovery commitments for this assessment. The Council will look for further evidence

[2] For example, the South East Catchment Water Management Board charges an $8-$9 land based levy as a fixed amount per property. The water based levy is $7.50 per hectare for area based allocations, and 15 cents per kilolitre for volumetric allocations.

of compliance with CoAG requirements including provision for taxes or tax-equivalents by irrigation schemes in its next assessment.

Consumption-based pricing

Governments have endorsed the principle that prices should reflect the volume of water supplied so that prices encourage more efficient water use and to give customers more control over the size of their water bill. For urban water providers using surface or groundwater, two-part tariffs (comprising a fixed access component and a volumetric cost component) are to be introduced where cost effective (clauses 3a and d).

South Australian arrangements

The Irrigation Act allows a water supply authority to declare a water supply charge or water supply charges based on one, or a combination of the following:

- the fact that land is connected, or the owner or occupier of land is entitled to have it connected, to the irrigation system;
- the volume of water supplied to land during the charging period to which the declaration applies;
- the area of the land to be irrigated; or
- such other factor or factors as the authority thinks fit.

The Act also notes that an authority may declare different charges for:

- different parts of the district to recover the supply or drainage costs associated with that part of the district;
- water supplied for irrigation purposes, domestic purposes or other purposes; and
- the quality of the water supplied.

In the case of water supplied for irrigation purposes the authority may declare a basic charge in respect of the water allocation and a further charge, or series of charges, that rise as the volume of water supplied increases in excess of the water allocation.

In relation to drainage charges the Act states that an authority by notice in a local newspaper can declare a drainage charge based on the area irrigated or drained or the volume of water supplied. Factors on which water supply or drainage charges are set can be appealed to the Environment, Resources and Development Court.

Charges set by Central Irrigators Trust, Golden Heights, and Sunlands include components for volume supplied and a service charge. Golden Heights and Sunlands also factor area of land serviced into charges. Lower Murray does not have a volume-based charges but rather uses a service charge and area of land serviced to set water bills (ANCID 2001).

Charges for licence fees have been discussed above but aim to broadly reflect the services consumed. In most cases water based catchment management levies are based on allocation. The North Adelaide Plains Water based levy also includes a charge for the amount of water actually used.

Discussion

The Council supports the inclusion of volume supplied in charges set by Golden Heights, and Sunlands as this provides a strong incentive to improve water use efficiency. The Council understands that volumetric charging is not possible in the Lower Murray district. It will look for charges with a volumetric component to be considered should this be facilitated through rehabilitation in the future.

In regard to licence fees Council suggests that the structure of these charges broadly reflects the services received. The Council supports the use of a two-part charge by the North Adelaide and Barossa Catchment Water Management Board for its North Adelaide Plains Water Based Levy. The Council suggests that this approach provides certainty of revenue through the allocation based charge and an incentive for water users to use water efficiently through the charge based on water use. The Council sees benefits in the extension of this approach to other boards where cost effective.

Assessment

The Council is satisfied that South Australia has met 2001 commitments in relation to consumption based pricing.

Community Service Obligations

Where service deliverers are required to provide water services to classes of customers at less than full cost this cost be fully disclosed and ideally be paid to the service deliverer as a CSO. Governments have agreed that the Council would not make its own assessment of the appropriateness of any individual CSOs but would review information provided by governments in totality to ensure that these CSOs do not undermine the objectives of the agreed water reform framework (clauses 3a and d).

South Australian arrangements

Section 69 of the *Irrigation Act 1994* empowers the State to provide financial assistance to an owner or occupier of a property within a government owned irrigation district. This assistance can be provided to improve irrigation or drainage to the property or to discharge a mortgage over the property. South Australia have advised that no CSOs are currently paid to private or public irrigation areas.

Assessment

South Australia has met 2001 commitments in regard to CSOs.

Cross-subsidies

Cross-subsidies should be transparently reported and ideally removed where they are not consistent with efficient service provision and use (clauses 3a and d).

South Australian arrangements

The Council only has limited information on the extent of cross-subsidies among South Australian rural water users. Structuring licence fees to reflect the cost of the services received assists in reducing cross-subsidies compared to past arrangements.

The Central Irrigation Trust provides a cross-subsidy between its eight districts where the total surplus is distributed among the districts. In 1999-2000 this resulted in all districts recovering the lower bound of the CoAG guidelines (with the exception of taxes). However, given that this cross-subsidy is transparently reported in the Central Irrigation Trust annual report it is consistent with CoAG commitments.

Assessment

The Council notes that a number of measures taken by South Australia have reduced the potential for non-transparent cross-subsidies. Therefore, while the Council is satisfied that their 2001 NCP commitments have been met, it will look for a more explicit treatment of cross-subsidies (particularly within all irrigation districts) when it next assesses progress.

New rural schemes

Governments have agreed that all investments in new rural water schemes or extensions to existing schemes should only be undertaken after appraisal indicates that it is economically viable and ecologically sustainable (Clause 3d(iii).

South Australian Arrangements

The Council has reviewed South Australia's processes for establishing economic viability and ecological sustainability in the second tranche assessment.

Recent developments

South Australia notes that there have been a number of proposals for the supply of additional irrigation water to existing high value added irrigation areas such as the Barossa and Clare Valley. A comprehensive environmental study was undertaken in the Barossa on a proposed pipeline project. Studies are also being undertaken into the environmental impacts in the Clare Valley. Environmental provisions and permitting restrictions have been included in the water allocation plans in the Barossa and Clare Valleys.

As noted above, the State is in the process of transferring government-owned irrigation areas to irrigation trusts that are managed by the irrigators. As part of the transfer process each district's water supply infrastructure is being refurbished. To date the eight major irrigation areas along the River Murray have been transferred. Rehabilitation of the Loxton area has been initiated while further work is being done to ensure the viability and sustainability of transferring the only remaining government-owned irrigation district, Lower Murray Reclaimed Irrigation Area.

Discussion

The Council's second tranche assessment reviewed the legislative and policy provision established by South Australia to ensure the economic viability and ecological sustainability of new rural water investments. The Council has not been advised of any significant changes to these arrangements since then and thus has looked for evidence of their effective application.

In regard to the proposals the supply of additional water to the Barossa and Clare Valleys, given that these activities are commercial and do not involve financial contributions from the Government, the Council is satisfied that these proposals, if they proceed, will be on an economically viable basis. The Council notes advice that environmental matters have been considered through the relevant water allocation plans. Other legislation such as the *Environmental Protection Act 1993* and the *Development Act 1993* also

provides protection. However, the Council has not been provided with documentation such as environmental impact statements demonstrating the ecological sustainability for these proposals. The Council will look for provision of this information once South Australia decides that the projects will proceed.

As with district rehabilitation undertaken prior to the second tranche NCP assessment, the Loxton rehabilitation project involves significant government financial contributions, with the Commonwealth and State each providing 40 per cent of the total cost. The Council has been advised that significant analysis has been undertaken prior to initiating the Loxton rehabilitation. It has been provided with a copy of a confidential report which identifies the financial, environmental and social benefits of the project and the implications of a 'do nothing' approach. The financial costs of the project are also included as are the results of a economic evaluation which yields a positive net present value. The Council is satisfied that this project has proceeded on an economically viable basis. However, no evidence of the project's ecological sustainability has been provided. The Council will look for provision of this information prior to its next assessment

Rehabilitation of the Riverland was undertaken using Commonwealth funding. South Australia advised that this money was conditional on restructuring water use in the region. This resulted in 42 per cent of the irrigated properties converting to dryland farming because irrigation was not viable.

In regard to the Lower Murray Irrigation areas, South Australia have advised that the future of this area is currently the subject of consideration by an Inter-departmental Steering Committee appointed by the South Australian Water Policy Committee. The Steering Committee is undertaking a major economic analysis of options available for possible rehabilitation of the existing infrastructure. In considering asset rehabilitation in the Lower Murray an options study has been prepared. There are also papers on pricing and returns, and a nutrient management study.

The region has a dominant focus on dairying and the options study includes examination of the viability of the industry in the region. Other significant issues being examined include an assessment of the water use and environmental water requirements of the Lower Murray swamps and wetlands.

In December 2000, the Environment Protection Authority released a discussion paper on drainage management in the Lower Murray for public consultation. The paper briefly reviews the water quality issues and options associated with drainage discharges from the Lower Murray swamps. It then proposes licensing of drainage under the *Environment Protection Act 1995*.

The River Murray Catchment Water Management Board has released its draft water allocation plan for the River Murray prescribed watercourse. This can be finalised after resolution of the Lower Murray cap and related matters.

The next stage will involve implementation of revised water allocations and licences, in accordance with the cap and the water allocation plan. The Department of Water Resources is developing a discussion paper covering the issues and options involved. This will deal with matters such as management of the environmental component, conversion of 'opportunity licences', water trading rules, introduction of metering and penalties for exceeding the allocation, and their links to the timing of rehabilitation and self-management.

The Office for Government Enterprises, on behalf of the Department of Water Resources, is developing a discussion paper on issues and options as to which government assets would be transferred and how they might be transferred. It will deal with such matters as irrigator and public interest considerations relevant to the future ownership of levee banks, Crown land and similar, and whether it would be best to use the Irrigation Act or seek other legislative provision to privatise government irrigation and drainage infrastructure.

Assessment

The Council is satisfied that South Australia has met 2001 commitments in relation to new investment. However, the Council will need prior to its next assessment evidence (such as an environmental impact statement) demonstrating the ecological sustainability of the Loxton rehabilitation project. The Council also requests that further information demonstrating the ecological sustainability of the Lower Murray rehabilitation proposal and the Barossa and Clare Valley proposals be provided following any final decision to proceed with these projects.

Institutional Reform

Structural separation

As far as possible the roles of water resource management, standards setting and regulatory enforcement and service provision should be separated institutionally by 1998 (clauses 6c and d).

South Australia established many of its institutional arrangements earlier than other States. It initially commenced structural separation of its water business and resource management in 1994. Subsequently, it passed the Water Resources Act in 1997 and undertook further institutional reforms. Hence, the Council has already assessed many of the issues associated with institutional separation in its second tranche assessment in June 1999.

South Australian arrangements

South Australia has only one water services provider – the South Australian Water Corporation that is responsible for urban and rural water and wastewater services. SA Water has outsourced water supply and sewerage services in Adelaide. The Minister for Government Enterprises is responsible for water services legislation, including SA Water.

In February 2000 the South Australian Government created a new Ministry of Water Resources and Department of Water Resources. The Minister for Water Resources is responsible for all water matters and resource management responsibilities have been transferred from the Department of Environment, Heritage and Aboriginal Affairs to the Department of Water Resources.

Recently, the State Water Plan 2000 has been finalised and released. Primarily this plan outlines South Australia's approach to water and environmental management (also see the discussion on allocations and trading and provision of water for the environment) though it does make a contribution to South Australia's institutional reform commitments by:

- clarifying and improving the transparency in water management and environmental regulation;

- expanding the number and breadth of catchment water management boards, including the establishment of a board for the Eyre Peninsula; and

- identifying a strategy to work with the Commonwealth Government, the Murray-Darling Basin Commission, the River Murray Catchment Water Management Board, local government and the local irrigation community to promote and restructure irrigation between Mannum and Wellington, including finalising the water allocation policy for the area.

The catchment water management boards are a mechanism by which communities can have input into the planning process and therefore improving the transparency and accountability of regulatory arrangements.

Economic regulation and service standards

While the Minister for Government Enterprises is the owner of SA Water and has the authority to gazette prices, South Australia argues that their arrangements provide for adequate structural separation because:

- the administrative arrangements under the *Public Corporations Act 1993* effectively ensure that the corporation operates at arms length from the Government and the Minister;

- performance targets for SA Water are set out in its Charter and Performance Statement and these documents are prepared by both the Minister for Government Enterprises and the Treasurer;

- Treasury and Finance have a strong role in scrutinising SA Water's activities because of the Treasurer's involvement in preparing SA Water's Charter and Performance Statement;

- any Ministerial direction must be gazetted within 14 days unless there are exceptional circumstances and in the last six years only one direction has been made (that issue was not commercially significant involving a single property owner);

- in practice decisions on pricing are made by Cabinet, not the Minister; and

- pricing policy is developed through an intergovernmental steering committee.

In the case of customer service standards performance targets are set in SA Water's performance statement and are, therefore, determined jointly by the Minister for Government Enterprises and the Treasurer. SA Water has produced customer service charters for both domestic and business customers and these are available on the internet.

Customers can raise any concerns initially with SA Water. Where they are not satisfied with this they have two options. One is to raise the issue with the State Ombudsman who provides one avenue for independent review of decisions. The second is recourse to the Minister (or Premier).

Discussion

In its assessment of structural reform the Council has focussed on whether the arrangements in each State and Territory are accountable, transparent and deal effectively with conflicts of interest.

The Council considered three broad areas of regulation when looking at institutional arrangements:

- economic regulation and service standards;

- resource allocation, water management and environmental regulation; and

- health regulation.

Of these, the Council's second tranche assessment concluded that, based on the information provided, South Australia's arrangements resulted in sufficient separation in resource allocation, water management and environmental regulation. That assessment, however, raised questions on independent economic regulation.

Economic regulation and service standards

Under the *Government Business Enterprises (Competition) Act 1996* responsibility for providing advice on prices charged by declared government businesses falls to the State's Competition Commissioner. The Commission is not subject to ministerial direction about a recommendation, finding or report. However, the Minister may require that certain facts, policies or issues be taken into account in particular investigations. Further responsibility for setting prices remains with the government.

At the time of the second tranche assessment SA Water was declared for prices oversight. The Competition Commissioner made one report on SA Water pricing in April 1997. In its second tranche assessment the Council raised issues about the constraints the government had put on the Commissioner's consideration of the pricing issues and the Government's failure to provide comprehensive reasons why it had rejected the Commissioner's recommendations.

Since then, declaration of SA Water has expired. In 1999 the South Australian Government initiated a review of future water and wastewater pricing options. That review was to consider, among other things, views about the best regulatory model for water pricing in South Australia and the appropriateness or otherwise of departing from current arrangements. While some approaches to pricing have been announced as a result of that review South does not intend to release the findings of this review.

Pricing regulation is an important part of the CoAG reform package. The Discussion Paper on Water Pricing in South Australia, recognises that:

> *By some standards more needs to be done to ensure that South Australians face water prices that will assist them to make the best decisions about piped water use, the assets that provide it and facilitate its use.* (SA Water 1999)

In its supplementary assessment in September 2000 the Council noted that in response to that discussion paper the South Australian Government has amended its current pricing framework.

However, the Council has previously expressed concerns about whether this framework meets the CoAG commitments with regard to transparency, cross-subsidies and pricing principles. An appropriate framework for natural monopoly service pricing starts with a required revenue target that reflects the efficient costs of providing the services demanded and then set prices within that framework. The South Australian proposals appear to make ad hoc adjustments to the current pricing structure which has no transparent reference to revenue targets nor underlying supply costs. This approach does not increase the Council's confidence that full costs will now be recovered. In fact the recent reforms could be seen to exacerbate the transparency problems the Council has already experienced in South Australia' pricing regime.

All of these issues would be resolved by the ability of an independent body to review the issues, publicly release a report, and the government to respond to that report and present a statement of reasons when it decides to adopt an approach divergent from the recommendations in that report.

The Council notes that all other jurisdictions now have some form of independent prices oversight of the water industry, with the exception of one other jurisdiction that has already committed to introducing independent prices monitoring.

In the second tranche NCP assessment South Australia indicated a timetable for the transfer of responsibility for plumbing regulation from SA Water to Planning SA. It was expected that that process would be completed by January 2000. South Australia has since informed the Council that the responsibility for regulation of plumbing remains with SA Water. Administrative costs and other inefficiencies associated with the strategy have been identified; for example, the loss of scale advantages. This has cast doubt on the net community benefit of transferring plumbing regulatory functions to Planning SA. A paper is being developed to assess the costs and benefits. The Office of Government Enterprises will review this report before a final decision is made.

Drinking water quality

SA Water holds a Performance Agreement with the South Australian Government that requires it to achieve compliance with the health-related parameters of the 1996 Guidelines for filtered metropolitan supplies. SA Water has a longer term goal of complying with the health-related drinking water guidelines for the majority of the population of South Australia.

The Government Committee on Health Aspects of Water Quality determines drinking water requirements. The committee is a cooperative body with membership from the Department of Human Services, the Environmental Protection Agency, SA Water and the Local Government Association, and is responsible to the relevant Ministers for health, the water supply and the environment, through the respective chief executives. The committee monitors the performance of SA Water according to agreed levels of service and the 1996 Guidelines. These criteria require SA Water to notify the Department of Human Services immediately should a particular 'incident', such as detection exceeding agreed levels of faecal coliforms or turbidity, occur. SA Water is responsible for ensuring that its two contractors meet quality requirements established by the committee. United Water is also required to comply with targets set down in the contract. All are equal to or more stringent than those in the 1996 Guidelines and are regularly monitored by SA Water and reports are forwarded to the Department of Human Services. SA Water publishes the monitoring results in its Annual Report.

Assessment

The Council considers that the reforms introduced through the Sate Water Plan 2000 further enhance South Australia's approach to structural separation in resource allocation, water management and environmental regulation.

There is clear separation of the institutional arrangements for monitoring health standards for the contract water and sewerage service providers in Adelaide. The level of separation for SA Water, who is both the service provider and on the Government Committee on Health Aspects of Water Quality is less clear. However, the level of transparency in the process of setting and monitoring standards is sufficient for the Council to conclude that there is no severe conflict of interest in this aspect of regulation in South Australia.

The Council still has significant concerns about the transparency of price setting in South Australia. Decisions have been based on a selective response to a confidential review. This makes it impossible for the Council to be confident that pricing decisions will be consistently based on the principles set out in the water agreements. The consequence of this is that the Council will need to closely monitor all pricing issues in South Australia and review all changes to confirm their consistency with the water reform agreements. This includes continuing to seek information to confirm that cross-subsidies are transparently reported now and in the future.

Again, as noted earlier, moving to a more transparent approach to price setting and monitoring would remove the need for the Council to be closely involved in these issues in the future.

Therefore, while the Council does considers that, at this stage, these issues should not affect South Australia's competition payments it will continue to closely monitor progress in future assessments.

Performance monitoring and best practice

ARMCANZ is to develop further comparisons of interagency performance with service providers seeking best practice (clause 6e).

South Australian arrangements

South Australia has undertaken a series of irrigation benchmarking projects across a number of regions that include a variety of crops. South Australia is also continuing to participate in national benchmarking processes. SA Water is involved in WSAA Facts comparisons and also has three non-metropolitan urban centres included in the non-metropolitan benchmarking.

In the rural sector, three irrigation areas were involved in benchmarking in the 1997-98 and the 1998-99 reports. In 1998-99 the Lower Murray Swamps participated in benchmarking for the first time but the Renmark Irrigation Trust was not included, although it was part of the assessment in the previous year. It is possible that Loxton Irrigation Area will be involved in future rural benchmarking.

Assessment

South Australia is continuing to demonstrate a commitment to involvement in State and national benchmarking projects. Therefore, the Council has concluded that South Australia has met this aspect of the reform commitments.

Commercial focus

Metropolitan service providers must have a commercial focus, whether achieved by contracting out, corporatisation, privatisation etcetera, to maximise efficiency of service delivery (clause 6f).

South Australian arrangements

As noted in the Council's second tranche assessment SA Water was corporatised on 1 July 1995 and has outsourced water supply and sewerage services in Adelaide. These arrangements have continued.

Discussion and assessment

The Council is satisfied that South Australia still meets the requirements for its metropolitan service provider to have a commercial focus.

Devolution of irrigation scheme management

Constituents be given a greater degree of responsibility in the management of irrigation areas, for example, through operational responsibility being devolved to local bodies, subject to appropriate regulatory frameworks being established (clause 6g).

South Australian arrangements

At the time of the second tranche assessment South Australia had transferred ownership of the Highland Irrigation District to eight self-managing irrigation trusts. These bodies in turn created the Central

Irrigation Trust to provide day-to-day management and operational services for each scheme.

The Loxton Irrigation District is one of the last major irrigation areas to be converted to self-management. All formal approvals and processes have been completed, effectively clearing the way for its establishment as a private irrigation district on 1 July 2001. The Minister for Water Resources appointed a board in February 2001.

The Government owns and operates nine irrigation districts in the Lower Murray Reclaimed Irrigation Area. The South Australian Water Policy Committee is currently discussing the future management of these districts with irrigators. The Steering Committee is undertaking a major economic analysis of options available for possible rehabilitation of the existing infrastructure. This will form the basis for further negotiations with irrigators later in 2001.

Discussion and assessment

The Council considers that South Australia has met its obligations on devolution of responsibility for irrigation management. In its assessment in 2002 the Council will review progress in converting the Loxton Irrigation District to self-management, and the progress of discussions in the Lower Murray Reclaimed Irrigation Area.

Allocation

Water allocations and property rights

There must be comprehensive systems of water entitlements backed by separation of water property rights from land title and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality. Governments must have determined and specified property rights, including the review of dormant rights (clause 4a).

The South Australian water allocation process is addressed through a hierarchy of water management plans for specific water resources. The State Water Plan 2000 is the Government's overarching statement of policy intent, which sets the framework for water allocation plans, local water management plans and regional catchment water management plans (see the section on environment and water quality). water allocation plans for the prescribed resources of the State are the main vehicles for the allocation of water to users and the environment.

South Australian arrangements

Water property rights

The Council considered South Australia's property rights system against second tranche NCP commitments as part of the second tranche assessment in June 1999. Table 6 provides a brief summary of the features of the South Australian system.

Table 6: South Australian Water Property Rights

Key Item	*South Australia*
Entitlements/Rights	
Nature of water entitlement	Landholders may take water from a prescribed resource for domestic and stock use only. Domestic and stock rights are rights to use water for land occupants who have access to land adjacent to a waterway, occupy a bore, or occupy the land on which the water flows or occurs (surface water runoff). Domestic and stock use can be included under the licence requirement when a water resource is prescribed. This is the case for the River Murray and the Northern Adelaide Plains. Water rights over and above these basic rights require a licence for the taking and use of water.
Nature of water right	**Licences** specify volumetric entitlements and the conditions of use. They are issued in perpetuity in accordance with water management plans, separate from land title, transferable and enforceable. There are three levels of water management plans. These are water allocation plans, local water management plans, and catchment water management plans. For prescribed resources, water allocation plans specify the rules on how water will be allocated, including the reliability of water available under a licence and water quality. water allocation plans are also the means to grant, review and transfer licences. Unprescribed resources are not licensed. Local water management plans or broader catchment water management plans may be used to regulate unprescribed resources. All levels of plans must be reviewed every five years and must be consistent with the overarching State Water Plan 2000. This Plan provides clear specification of entitlements in terms of ownership, volume, reliability and transferability. The Plan provides a target that by 2005, all water allocations are to be converted to a volumetric basis and all water use will be measured. Surface water runoff can be considered in plans. There is no provision for compensation in the event that a water allocation is reduced in accordance with the objectives of the Act. Decisions are subject to appeal to the Environment Resources and Development Court.

Water Resources Act

The *Water Resources Act 1997* provides a comprehensive system of transferable property rights for water allocations. The objective of the Act is:

To establish a system for the use and management of the water resources of the State that ensures the use and management of those resources sustains the physical, economic and social wellbeing of the people of the State and facilitate the economic development of the State while:

- *ensuring that those resources are able to meet the reasonable foreseeable needs of future generations; and*
- *protect the ecosystems (including the biological diversity) that depends on those resources.* (s6)

The Act delineates between prescribed resources which are subject to licensing and non-prescribed water resources. A resource may be prescribed by the Governor on the recommendation of the Minister for Water Resources based on the level of consumptive use and the condition of the watercourse. water allocation plans are then prepared for prescribed resources. Decisions in all aspects of water allocation must be made by the Minister by reference to the water allocation plan. The Minister is required to make decisions which are in the public interest and consistent with the requirements of the plan. In the second tranche, there were 24 prescribed water resources in South Australia.

The primary objective of the *Water Resources Act 1997* is the implementation of ecologically sustainable development principles. This includes protection of water dependent ecosystems (including biodiversity) and the need to take a precautionary approach to water resources use and management. All parties involved in the administration of the Act must act consistently with this objective. All water plans produced must be consistent with the State Water Plan and the objectives of the Act and are legally binding.

The hierarchical planning approach, fundamental to the operation of the Water Resources Act, provides the opportunity to use the planning tool most appropriate to the particular resource management needs, within a context of broad Statewide policy. South Australia has adopted the position of making provisions for environmental water needs implicit in the allocation policies of water allocation plans.

State Water Plan 2000

The State Water Plan 2000 is the key statutory document under the Water Resources Act 1997 for water resource management in South Australia. The purpose of the State Water Plan is to set the policy framework for all water plans for the use and management of South Australia's water resources and to provide a Statewide assessment of the state of those resources. The Act requires the State Water Plan to:

(a) assess the state and condition of the water resources of the State;

(b) identify existing and future risks of damage to, or degradation of, the water resources of the State;

(c) include proposals for the use and management of the water resources of the State to achieve the object of the Act; and

(d) include an assessment of the monitoring changes and condition of the water resources of the State and include proposals for monitoring those changes in the future.

All other plans produced under the *Water Resources Act 1997* must be consistent with the State Water Plan. Actions identified in the State Water Plan 2000 relating to the management of water allocations and entitlements are listed below.

- **Water allocation.** The Government will, by 2005, have converted all water allocations to a volumetric basis and all water use will be measured so that the Department for Water Resources can determine the annual amount of water taken;

- **Information on water allocation.** Building on current practice for the River Murray, the Government will make information on water allocations and use readily accessible;

- **Review of water plans**. In accordance with an adaptive management approach that regularly takes into account new information, all water plans, including the State Water Plan and water allocation plans, are to be reviewed regularly (at least once every five years) in accordance with the requirements of the *Water Resources Act 1997*;

- **Precautionary approach to determining sustainability.** The Government will continue to take a precautionary approach to defining sustainable limits that recognise the variability of water resources. In calculating sustainable limits, a precautionary approach means that estimates of sustainable yield will be lower where there is limited knowledge, large existing use, higher risks and/or a more variable resource;

- **Management in areas where there is no catchment water management board**. The State Government will work with local government to promote the introduction of integrated management of waterbodies and water-dependent ecosystems in either local water management plans or development plans.

Prescribed resources

In South Australia 'stressed systems' are addressed primarily through the process of prescription of the water resources under the *Water Resources Act 1997*. Once a resource is prescribed, a person may not extract water from that resource for purposes other than domestic and stock watering requirements

unless authorised to do so by a water licence. Stock and domestic use can be included under the licence requirement depending on the regulation prescribing the water resource. Water extraction must be in accordance with any conditions on the licence and the provisions of the relevant water allocation plan.

The process of prescribing a water resource or imposing restrictions may be initiated by:

- concerns about the amount of, or potential for, water resources development in an area; or
- concerns about water quality issues such as salinity or algal blooms.

These concerns may emerge from monitoring results, or other processes within Government, industry or the community that are directed to the Minister. This will generally lead to investigations into the status of the resource. In some areas, prescription has occurred with little or no consultation with industry or the community, because of the existing high level of water resources development. In other areas, restrictions on any further development for a maximum of two years have been declared. During the period of the restrictions, more detailed investigations into the status of the resource are conducted. In the past, this process has focussed on quantifying the resource, the amount of extraction and impacts on water quality.

Licences

Water licences are issued by the Minister and must be consistent with any relevant water allocation plan. Licences specify the volume of water that can be taken and the conditions of use. They are the primary tools for regulating water management in South Australia in prescribed areas. Licences remain in force in perpetuity unless they are terminated by or under the Act. As specified by the Act, water licences are:

- the holder's personal property. These rights are reinforceable by court order from the Environment Resources and Development Court. The Act states that:

  > *A licence (including the water allocation of a licence) is personal property vested in the licensee and will pass to another person…in accordance with any other law for the passing of property.* (s29(5))

- not linked to land title, and
- are fully tradeable, both on a temporary and permanent basis.

Holding allocations issued under the Water Resources Act are entitlements that currently apply in the South East and on the River Murray. They do not entitle the holder to take water. To convert a holding allocation into a taking

allocation, the licensee needs to obtain appropriate approvals including undertaking an impact assessment.

Register

South Australia has a water licence database register which records all water rights, including provisions for transfers and sale of water allocations. All transactions on the system are separately audited on a weekly basis. South Australia has advised that the registry system database is planned to be updated to move towards a full Torrens Title system for water licences. The system can be viewed at any water licensing office. The planned upgrade of the system will provide for on-line internet access to regularly updated water licensing information.

Section 47 of the Act provides for the registration of interests in a licence. There is no limitation on the type of interest that can be recorded in the licence.[3] The register ensures that no licence transactions can occur without notification being given to a third party interest in a licence. An application to register an interest must be made by the licence holder. Accordingly, a third party with security must ensure that the registration occurs before any dispute arises with the licensee.

Banks or other interested parties can lodge a notation of interest on water licence application form (combined with an administration fee) to have their interest recognised on a water licence. This information is then recorded on the water licence register. The register's administrative protocols guarantee that all interested parties are contacted prior to any permanent transfers of water allocations or approval for sale of a water licence.

Water allocation plans

Reliability and quality are not specified on a water licence but are dealt with through water allocation plans. The plans aim to establish a rate of use that is sustainable, and make provision for environmental water needs. They are prepared by either a water resources planning committee, or if the prescribed resource lies within the area of a catchment water management board, then it is prepared by the board.[4] Water allocation plans are then developed through an extensive community consultation process.

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[3] However, the register must keep 'such information as the Minister thinks fit.'

[4] The boards and committees are comprised of people with relevant expertise, knowledge and experience in a range of areas including water resource conservation of ecosystems, management, business administration, regional economic development, local government, and community affairs.

The relevant water allocation plan is the main vehicle for achieving provision of water for the environment. As described in the second tranche report, the plans must:

- assess the water needs of dependent ecosystems located either within or downstream of the prescribed resource;
- set out how water will be allocated to licensed users in the form of private property;
- describe how water trading will apply in that area;
- provide for monitoring arrangements; and
- provide for sustainable allocation and use of the available water.

Under s37 of the Act, the Minister may reduce water allocations stipulated on water licences to prevent a reduction, or further reduction, in water quality, or to prevent damage, or further damage, to dependent ecosystems. The Minister when making a decision that is based on an assessment of the quantity of water available must also take into account the water needs of ecosystems.

The granting, review and transfer of licences is provided for by the relevant water allocation plan. Water allocations are expressed as a volumetric allocation based on metering.

As noted in the second tranche report, of the 24 prescribed resources in South Australia, eight prescribed resources are not required to be the subject of water allocation plans or catchment water management plans. Water allocation plans have now been prepared to cover all licensed use in the 16 prescribed water resource areas across the State. Of the 16 prescribed areas, 12 related to groundwater resources, two are groundwater and surface water areas (the Barossa Valley and Clare Valley) and one is surface water (the River Murray). Of these, the Minister has implemented fourteen plans. The final plan is to be completed late in 2002.

Local water management plans

In the second tranche report, South Australia noted there were several stressed rivers that were not prescribed but were located in broad catchment management areas. South Australia has advised that the needs of these resources are to be addressed by either local water management plans or broader catchment water management plans (see environment and water quality section).

The Department for Water Resources promotes the development of local water management plans in areas outside of catchment boards in order to provide links between development, planning decisions, the impact on water resources, and controls over farm dams. Local water management plans are

then submitted for the Minister's approval. While no licence is required for these resources, use should be consistent with any local water management plan where one exists.

In the second tranche NCP assessment, South Australia was in the process of developing the first local water management plans, including an intention to appoint a local water management planning officer to assist and promote the development of local water management plans. No local water management plans have been commenced or adopted to date. The reasons for this are that where a catchment water management board already exists and a catchment water management plan is being prepared, this provides for a more integrated approach to catchment management. This has resulted in a number of councils no longer pursuing the preparation of local water management plans.

However, there has been a commitment by four mid-north councils to prepare local water management plans, and these are expected to be progressed late in 2001. The Department for Water Resources is preparing guidelines for these councils to use in the preparation of plans.

Overland flows and farm dams

The treatment of surface water run-off can be considered in water management plans. In relation to farm dams, the State Water Plan 2000 states:

> *It is estimated that there are at least 15 000 farm dams in the Mount Lofty Ranges and that 10 per cent of these capture 70 per cent of the total farm dam volume…In the Barossa it has been estimated that mean annual yield from the North Para River has declined by 20% over the last 30 years due to farm dams. The vast majority of farm dams are built on watercourses which reduces the duration of flow and can increase the frequency and duration of dry conditions downstream.* (DWR 2000a, p. 48)

The State Water Plan also notes that the criteria for constructing farm dams are also an issue in the Mount Lofty watershed. In this region, farm dams are allowed to be built up to an aggregate capacity of 50 per cent of the mean annual runoff from the property. Modelling has estimated that if the 50 per cent rule was applied across all of the watershed where it is practical to build farm dams, there could be a 30 to 40 per cent reduction in inflows to SA Water reservoirs in average years. The scale of farm dam development in the Mount Lofty ranges also puts at risk the yield to public water supply reservoirs as well as impacting on ecological values.

The policy in the State Water Plan for dealing with farm storages outside of prescribed areas is stated as:

> *Outside of prescribed areas, and until there is addition information, 25 per cent of median annual adjusted catchment yield should be used*

> *as an indicator of the sustainable limit of the catchment surface water and watercourse use…In reality due to evaporation seepage and overflows, only about half the dam volume can actually be used hence where a sustainable use limit of 25 per cent of the median annual runoff from the catchment applies this will convert to 50 per cent of the median annual runoff in terms of allowable farm dam volume for a catchment.* (DWR 2000a, p. 50)

A report by the Minister for Environment and Heritage entitled the 'State of the Health of the Mount Lofty Ranges Catchment' made the following comments on the farm dam issue:

> *Most dams are found high in the catchment where rainfall is greatest. If the dam is large, water can be completely prevented from flowing downstream or recharging aquifers…These dams have substantially altered the flow regimes of waterways and have restricted our ability to accurately quantify water use. This has severely limited the ability to calculate the amount of water available for sustainable use.* (EPA 2000a, p. 18)

South Australia has advised that it is currently considering developing a policy proposal to the farm dams issue where necessary. The Mount Lofty Ranges region is covered by four catchment water management plans and work is underway to coordinate the policies for farm dams. These plans have set criteria for issuing permits for dams relating to size, and impact on downstream users and ecosystems.

There are a number of mechanisms for regulating farm dams in water allocation plans. For example, the Clare Valley water allocation plan provides the following mechanisms to address the farm dams issues:

- limits have been set for dam development at the sub-regional, catchment and property level;
- policies are included which aim to control the distribution of dams throughout a catchment; and
- criteria have been developed regarding the location, design and diversion regimes for dams.

MDBC cap compliance

All diversions including irrigation from the River Murray and diversions by SA Water for urban service provision are fully licensed. South Australia's diversions for 1999-2000 were within the Murray—Darling Basin cap requirements for country, urban and irrigation areas.

Surface water overallocation

The National Land and Water Resources Audit Assessment of Water Resources 2000 has provided data on surface water resource use for South Australia including those areas where the resource is approaching full allocation or is overallocated in relation to the sustainable yield[5]. The audit notes the concept of sustainable yield is difficult to apply and in a number of instances sustainable yield data were not provided in the audit's assessment. The preliminary data are shown in table 7 below.

Table 7: Summary of data for surface water management areas that are over full allocation

Surface water management area	*Developed yield*	*water use (megalitres)*	*Sustainable yield*
Gawler River	21 800	31 162	12 100
Gawler River – subcatchment Little Para River	8 300	35 223	2 200
Myponga River	10 880	1 003	4 500
Onkaparinga River	53 600	40 102	20 000
Torrens River	36 300	130 707	13 000

Source: NLWRA 2001a

South Australia has advised that there are substantial problems in the use of the data for developed yield, water use and sustainable yield for surface water allocation. The data on developed yield is meant to measure potential annual water use from existing infrastructure. While it is a concept well suited to catchments where most of the storage capacity is in large dams, it is problematic in catchments where farm dams are prevalent.

The definition of water use is problematic where data on actual water use is virtually absent due to water transfers between catchments. South Australia has advised that for all of the catchments identified in the table above are subject to significant transfers from either the River Murray and/or between each other.

Further, the definition of sustainable yield for surface waters outside the River Murray has been defined by the State Water Plan as 25 per cent of median annual catchment yield. This is an indicator statistic intended as a planning tool to set priorities for investigations rather than an objective measure of sustainability. It is based on limited information drawn from a few indicative surface water catchments and then applied to catchments across the State. There is currently no clear scientific understanding of what is a sustainable limit to water extraction in these type of streams. Even in the larger, permanent river systems where the majority of assessments of

[5] South Australia has defined sustainable yield for surface water management areas as '50 per cent of the water captured or 25 per cent of the median annual run-off from the surface water management area.

environmental water requirements have been done this is a matter of scientific debate.

In conclusion, South Australia has advised that in all cases the figures presented in the audit are preliminary only and are based on limited data and analysis. All of the surface water systems identified in the audit table contain large public water supply reservoirs, and inter-catchment water transfers which confound the accuracy of the figures. Hence while the data would appear to suggest overallocation, the accuracy of the figures are such that a reliable conclusion cannot be drawn.

South Australia has recognised the data limitations identified by the Audit. Accordingly, the South Australian Government is investing $4.8 million to collect additional data on water quantity and environmental water requirements in the Mount Lofty Ranges. This work will commence in 2001-02 and be completed over the next four years. The work will build on a detailed hydrological model study and monitoring methods developed to identify water dependent ecosystem flow requirements. Additional data will clarify the allocation status of these systems within the framework established by the audit and allow for fully informed policy responses.

Where surface water overallocation is recognised as a problem, South Australia has advised that the problems could be addressed:

- in some areas other sources of water, such as the treatment of effluent are becoming available;
- in the South East, the understanding of the resource is still being developed. The 5 yearly review of the water allocation plan could allow for clawback if this proves to be necessary; and
- through effective community involvement, local communities can reduce their own allocations to approach a sustainable regime.

Groundwater

The Audit also provided data on groundwater resource use for South Australia including where the resource is approaching full allocation, fully allocated or over allocated in relation to the sustainable yield as summarised in Table 8.[6]

[6] The definition of sustainable applied by South Australia is the groundwater extraction regime, measure over a specified planning timeframe that allows acceptable levels of stress and protects the higher value uses associated with the total resource. The sustainable yield is determined by the rate at which groundwater can be pumped without causing long-term decline of potentiometric surface or undesirable effects – such as salinity increases. (NLWRA 2000a, p.139)

Table 8: Summary of data for groundwater management units that are at full allocation or overallocated

Groundwater management unit	*Total abstraction (megalitres)*	*Total allocation (megalitres)*	*Sustainable yield*
Gerangamete	9 447	12 619	4 000
Tatiara 1	60 900	90 500	86 500
Northern Adelaide Plains T1	18 400	26 500	8 000
Willunga Embayment[a]	6 500	6 000	6 000
Great Artesian Basin – Central South Australia	4 300	4 300	2 880
Great Artesian Basin – Southwest Springs	42 080	42 080	27 550
Great Artesian Basin – Western South Australia	380	380	330
Great Artesian Basin – Western Recharge	4 610	4 610	4 030

[a]The Wilunga area is encompassed in the water allocation plan for the McLaren Vale Prescribed Wells Area

Source: NLWRA 2001a

South Australia has a number of water allocation plans addressing issues of groundwater overallocation. The McLaren Vale Prescribed Wells Area provides for groundwater allocation in excess of the sustainable yield up to 1 July 2003 to provide a transition period. Thereafter allocations are to be decreased through a process of reallocating water rights to the level of the sustainable yield. The Tatiara and Northern Adelaide Plains areas are prescribed wells areas and a water allocation plan is in place for each. The Great Artesian Basin has its own strategy to reduce water use.

Discussion and assessment

The Council has considered further the efficacy of the South Australian property rights system since the second tranche NCP assessment. In that assessment, the Council was satisfied that the Water Resources Act provided an effective allocation system for prescribed water resources consistent with obligations. The Council did note however that there was a need to review the effectiveness of the system in the lead up to the 2001 assessment, including evidence that completed water allocation plans for prescribed resources were based on robust assessments of environmental needs.

The Council considers that it would be optimal for rights to be vested in the end user. However, where rights are not vested in the end user, the Council believes the rights must still be able to ensure a licence-holder can:

- invest in the rights;
- buy and sell the right commodity (that is, trade it); and
- plan business activities based on the surety of the rights.

For these reasons, the Council has reviewed the efficacy of property rights in terms of the following three criteria.

- First, the reliability should be specified — There should be enough information to enable stakeholders to know what they have got and to be able to trade.

- Second, the length of the right, the presumption of rollover of a right unless there is a specific need for change, and the registry system need to be adequately established to enable the right to hold a third-party interest such as a mortgage. A right does not to be granted in perpetuity.

- Third, whether there is provision for compensation during the term of a water management plan based on the frequency and likelihood of the need for change. If there is a low frequency need and likelihood of change based on the needs of the environment during the plan's life, then no compensation may be necessary. If there is a high frequency need for change based on environmental needs (for example, a high level of overallocation), then compensation may be payable.

The Council has considered the intricacies of the property rights system in South Australia. South Australia is the only jurisdiction where property rights are vested in private users as a personal property right.

Given and the ownership of rights is clearly established, the Council has examined the South Australian system to determine the reliability of water property rights. In particular, while the licence and the allocation are issued in perpetuity, the reality is that changes to allocations may be made every five years in a review of water management plans and there is no provision for compensation.

South Australia believes that their system of property rights does provide sufficient certainty for irrigators. South Australia's water supply from the River Murray is very reliable with a minimum flow at the border being guaranteed under the Murray–Darling Basin Agreement and South Australia adopting a very conservative approach to allocating water based on minimum flows. Therefore, the allocations are stable and there are no wide fluctuations based on climatic variability. This means that licence holders do not expect to see large changes in their water allocations over time and are, therefore, comfortable with five-yearly reviews.

The need for changes in allocations and compensation is therefore considered to be very low. While there is no formal system of reporting on the state of the resource within the five-year cycle so that irrigators have early and regular information on the likelihood of changes in allocations, some water allocation plans do identify problem areas and there is annual monitoring and reporting on the level of water use. South Australia was the first jurisdiction to come to the limits of its irrigation water supply so that any increase in use has had to come from existing users. These factors, and the predominance of vines, tree crops and dairy pastures have made for well-defined rights in water.

With regard to the registry system, the Council notes that the water licence register is a public information database and that South Australia is planning to move to a Torrens Title system for water licences. Given water licences and allocations are vested in the end user and backed by personal property law this is considered to provide for a high level of security of rights. The South Australian system provides for third party interests in a licence and for interests to be noted on the register. The Council also notes South Australia's intention to launch the register on a website.

The Council is concerned about the level of farm dam development in some areas of South Australia and the potential impact on environmental flows. South Australia has recognised this issue and is implementing measures to address the concern. For example, in relation to farm dams the Council notes the following:

- the State Water Plan has recognised that farm dams have impacts on stream flows and aquifer recharge;

- the report on the 'State of the Health of the Mount Lofty Ranges Catchment' indicates farm dam regulations are being reviewed and existing farm dams assessed; and

- there is a capacity in water allocation plans for prescribed areas to regulate the amount of water that can be captured in farm dams. The Council has examined the water allocation plan for the Clare Valley Prescribed Water Resources area where limits have been put in place for on and off stream dams.

In relation to groundwater, the Council has examined three water allocation plans[7] and has found that issues of groundwater sustainability are being addressed by these plans.

The Council considers that South Australia's system of water property rights meets the requirements for this assessment. The Council will continue to monitor developments as issues arise. For example, regulation of the farm dams issue and the ability of third party interests listed on the register to have priority over non-registered interests are issues that are quite likely to emerge in future assessments.

[7] The McLaren Vale Prescribed Wells Area plan, the Northern Adelaide Plains Prescribed Wells Area plan and the Clare Valley Prescribed Water Resources Area plan.

Provision for the environment

Jurisdictions must establish a sustainable balance between the environment and other uses, including formal provisions for the environment for surface water and groundwater consistent with the ARMCANZ/ANZECC national principles.

Best available scientific information should be used and regard should be had to the intertemporal and interspatial water needs of river systems and groundwater systems.

For the 2001 assessment, States and Territories have had to demonstrate substantial progress in implementing their agreed and endorsed implementation programs. Progress must include at least allocation to the environment in all river systems that have been overallocated, or that are deemed to be stressed. By 2005, allocations and trading must be substantially complete for all river systems and groundwater resources must be identified in implementation programs.

Jurisdictions are to consider environmental contingency allocations, with a review of allocations five years after they have been initially determined (clauses 4b to f).

In South Australia, allocations for the environment will be achieved in two stages. Firstly, water allocation plans for all prescribed resources will be determined under the *Water Resources Act 1997*. water allocation plans must identify both environmental water requirements and environmental water provisions, and provide for regular monitoring. Environmental water provisions will be formally recognised and protected through the legally binding provisions of water allocation plans. All water allocation plans must be consistent with the provisions of the State Water Plan 2000, which set out requirements for the management of environmental provisions. Second, water allocation plans will be incorporated into comprehensive catchment water management plans.

South Australian arrangements

The State Water Plan

The State Water Plan establishes Statewide policy for water for the environment with a framework of integrated policies for the management of all water-dependent ecosystems such as wetlands, riparian zones, estuaries and floodplains. This is a significant policy advance as previously the policy approach to the management of these ecosystems was fragmented and lacked focus.

The State Water Plan establishes principles and a process for determining and improving environmental water provisions. These policies are now being utilised in developing water management plans. Actions identified in the State Water Plan 2000 relating to the management of water environmental allocations include the following initiatives.

- **Stressed resources review**. The South Australian Water Policy Committee will conduct a stressed resources assessment review and advise the Government on a process that identifies water resources under

stress, or at risk of stress. The review will include social, economic, ecological and legal considerations and will link to the State Water Monitoring Review. This review has focused to date, on documenting and reporting on the legislative and business requirements of agencies for water monitoring and monitoring information. The stressed resources review is to be a statewide process to identify water resources under stress or at risk of stress and identify appropriate management responses. The process will take account of a range of ecological and hydrological factors, with water extraction being important but not the only factor in evaluating if resources are 'stressed'. South Australia envisages that the process will link to the statutory requirement that the Minister for Water Resources report to Parliament each year on the implementation of the State Water Plan. It is planned to develop the process during 2001. The work has been delayed while the National Land and Water Resources Audit, and new water allocation plans for prescribed resources were completed. The review will form the basis to further develop service level agreements between water management agencies, public health and water supply authorities.

- **Improving knowledge in relation to water for the environment**. The Department for Water Resources and Department for Environment and Heritage will support efforts to improve knowledge in relation to water for the environment, including working in partnership with catchment water management boards and other authorities.

- **Wetlands management strategy.** The Government will develop a Statewide wetlands management strategy in consultation with catchment water management boards and other relevant stakeholders to improve the management of wetlands across the State.

- **Estuaries management**. In relation to estuaries the State Government will, through the Marine Managers Forum, and in conjunction with local government, catchment water management boards and other relevant stakeholders:

  – develop a South Australian estuaries management implementation plan that establishes an agreed approach to the management of estuaries and that articulates the roles and responsibilities of the community, local government, the State Government and the Federal Government in estuary planning and management in this State; and

  – review and, as appropriate, recommend revised legislation or other actions to support the agreed approach.

Identifying stress

The approach used to date in South Australia to identify stressed water resources has been based on an assessment of the development pressures on the resource rather than the state of ecological health of the ecosystems dependent on those resources. This is known as the Pressure-State-Response

indicator system, and is widely used in state of environment reporting. The rationale for this is:

- pressure indicators are more easily quantified;
- other indicators may be indicative of many changes in a catchment or stream outside of just water resource development; and
- there can be time lags between pressures and an ecological response.

In the River Murray and some groundwater systems, 'state-type' indicators such as salinity and water level, have been used to identify resources under stress.

The nature of the relationships between hydrology and ecology is especially unclear in temporary and ephemeral streams that are predominant in South Australia, and so the issue of time lags is very relevant. Therefore, a response based on pressure indicators is regarded as more pro-active.

Under the Water Resources Act, any notices of restriction must consider the needs of water dependent ecosystems, and once prescribed, water allocated for consumptive use must recognise environmental requirements. This will require greater understanding of the ecology of South Australian streams, which in turn will allow for more use of state-type indicators.

In the past, a number of pressure-type indicators have been used in determining stress. For surface water, these include:

- number of farm dams in a given area;
- total volume of farm dams in a given area;
- percentage of mean annual runoff being captured by dams; and
- total annual volume of water extracted by pump or diversion.

For groundwater, the indicators used include:

- reduction in water table levels or groundwater pressures;
- increases in salinity; and
- a comparison of use to recharge across a certain area.

In the current round of water allocation plans that have, or are being prepared, additional indicators are being used in determining stressed resources, including:

- changes in flow duration or seasonality due to water harvest;
- changes in frequency of different size flow events;

- changes in the pattern or seasonality of water level in wetlands due to surface or groundwater harvesting;

- loss of aquatic biota that have life-histories known to be affected by changes in water regime; and

- reduction in the health or extent of riparian or aquatic vegetation.

The level of 'stress' in a water resource is not clearly scientifically defined. Rivers may be 'stressed' but by differing 'stressors'. For example, the Marne River may be considered to be stressed by water extraction, and it is therefore now under a notice of restriction to prevent any additional extractions. Similarly, the Inman River may be considered to be stressed, but by poor water quality and erosion but not by water extraction, and is therefore regulated for pollution abatement. South Australia's approach is to address each of the elements that make up aquatic ecosystems not the just the water quantity.

Environmental water provisions

South Australia advises that the water allocation plans seek to provide for ecologically relevant environmental water provisions. South Australia has advised that, with the exception of the River Murray[8], it does not set volumetric environmental allocation. Because South Australia's systems are generally unregulated systems or groundwater, volumetric allocations are not appropriate. Instead licence conditions are set to control how and when people use water. Therefore, South Australia has a policy of establishing provisions for environmental water through legally binding mechanisms established by water allocation plans rather than volumetric allocations for the environment.

South Australia has used the following principles in the State Water Plan 2000 in determining 'sustainable yield'. Key principles for sustainable groundwater yield are:

- the time frame must be sufficient to deal with any ecological threshold effects and time lags between development pressures and any responses. This means that water allocation plans may specify a long-term management regime but with five-year targets and reviews;

- sustainable yield is an extraction regime not necessarily a fixed volume. It means a set of extractions over a specified time period, and includes consideration of the distribution of wells, extraction rates, water levels (or pressure) and water quality;

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8 In the River Murray 60 per cent of the minimum drought flow remains in the river. Only about 14 per cent of the median flow is allocated to irrigation.

- in calculating sustainable yields a precautionary approach must be taken with sustainable yield being lower where there is limited knowledge, large existing use, higher risks and less reliable recharge; and

- sustainable yield will vary for every resource.

These principles, in combination with hydrogeological assessments, have been used to identify likely environmental water requirements for the ecosystems identified as likely to be groundwater dependent. This is done by:

- identifying the ecological values of the water resources, that is, identify the groundwater dependent ecosystems:

  - in all cases this has been done using the questions set out by the New South Wales Conservation Council (1999) Desktop Methodology to Identify Groundwater Dependent Ecosystems. This process first lists possible groundwater dependent ecosystems and then poses a series of questions that assist in determining likely groundwater dependence; and

  - it is a reflection of the poor state of scientific knowledge regarding groundwater dependent ecosystems that the methodology used identifies an ecosystem as groundwater dependent if only one question is answered in the affirmative. This highly precautionary approach is sensible given the level of knowledge; and

- identify the water requirements of these groundwater dependent ecosystems:

  - in the past 'sustainable yield' was used in many places, including South Australia, to refer to the volume of water that equaled the long-term average annual recharge. This concept in now discredited as it takes no account of time lags, aquifer geometry, location of groundwater dependent ecosystems in relation to extraction points, discharge rates or seasonal water level fluctuations.

This has resulted in a range of policies that deal with groundwater levels, seasonal fluctuations in levels, minimum setbacks of extraction wells from groundwater dependent ecosystems, minimising impacts of discharge points and maximum allowable concentrations of extraction points. These issues have been addressed in policies for granting new allocations and for transfers of existing allocations.

South Australia has provided two examples to explain how environmental water provisions have been set in two different but typical South Australian water resources.

The Clare Valley Prescribed Water Resources Area

The process for setting the water allocation policies makes provision for environmental water needs using the following strategies:

- environmental water requirements. This was done using a combination of expert panel, habitat assessment and ecosystem methods. Data was collected on key biotic groups (fish, macroinvertebrates), habitats, geomorphology and hydrology. Rivers were segmented on the basis of geomorphic, habitat and hydrological parameters and ecological processes were investigated including hydrology-ecology relationships were defined. Key flow bands (with duration, seasonality, frequency) were identified for different ecological functions at indicative gauging stations;

- existing water resource development was assessed. This included on-stream and off-stream dams;

- hydrological modelling of different policy scenarios was undertaken to assess impacts on the flow bands that were identified as key environmental water requirements;

- policies were adopted in the draft water allocation plan that are expected on the basis of the modelling to protect the flow bands;

- after public consultation, the Minister for Water Resources has adopted these policies in the water allocation plan.

Box 2 describes the policies implemented by the plan to provide water for the environment.

Box 2: Development of environmental water provisions for a seasonal stream system – the Clare Valley Prescribed Water Resources Area

The Clare Valley Prescribed Water Resources Area is situated within the Northern Mount Lofty Ranges. Most of the Clare Valley receives an annual average rainfall of 600 to 650 millimetres. Flows in the streams of the Clare Valley are seasonal with most rainfall occurring during Winter-Spring and are highly variable from year to year. Modelled data over 102 years suggests that the mean annual yield is equalled or exceeded only one in four years. Almost all surface water used for consumption is captured in on-stream farm dams with a smaller volume diverted to off-stream farm dams. Such highly variable systems present particular challenges in making ecologically relevant environmental water provisions and allocating for regular consumptive use.

The policies implemented by the water allocation plan are about limits to water development, controls on the types and locations of dams and wells, and controls on the timing and condition of off-stream pumping or diversion. The key policies that provide water for the environment are:

- sub-catchment limits to surface water storage have been defined based on 0.2 megalitres per hectare runoff. This is loosely based on the concept of 50 per cent of the median annual catchment yield. For many parts of the Plan, 0.2 megalitres per hectare is less than 50 per cent of the median annual catchment yield and so is precautionary;
- based on these limits for most of the sub-catchments in the Clare Valley, no further surface water development is allowed. For the others, it is limited and within restrictive policies designed to protect the identified flow bands;
- in sub-catchments where additional farm dams are allowed:
  - there must be off-stream on specified watercourses (defined as having a catchment area greater than 300 hectares); and
  - are allowed on-stream for smaller catchments but these must include low flow bypasses and the total volume of storage in these dams must not exceed 0.05 megalitres per hectare for the whole sub-catchment;
- diversions to off-stream dams cannot commence until defined threshold flows are reached and then maximum extraction rates are defined; and
- wells are not allowed within defined zones around ecologically significant permanent stream pools or sections of river.

The approach taken in the Clare Valley Prescribed Water Resources Area water management plan is innovative. It protects environmental water requirements through a set of integrated allocation policies that are ecologically meaningful for such a variable system. Fixed annual environmental allocations would not be ecologically appropriate for these systems.

The Musgrave Prescribed Wells Area

The Musgrave Prescribed Wells Area is one of two Prescribed Wells Areas on the Eyre Peninsula. Both have very similar groundwater resources and have adopted the same approaches to water allocation and environmental water provisions. Box 3 is presented as an example of how the policies in a groundwater allocation plan provide water for the environment.

Box 3: Development of environmental water provisions for a groundwater resource – Musgrave Prescribed Wells Area on the Eyre Peninsula

The Musgrave Prescribed Wells Area is an area of low rainfall and high evaporation, with shallow soils and some sand dunes overlaying a calcrete plain. There is very limited surface water and the groundwater resources occur in the Quaternary Limestone Aquifer and the Tertiary Sands Aquifer.

The Quarternary Limestone Aquifer is unconfined, high yielding and the predominant source of non-saline water. It is recharged by diffuse recharge from local rainfall. There is a strong relationship between high winter rainfall events and recharge. Groundwater levels in this aquifer are strongly controlled by the winter rainfall of the current and recent years. There is some evidence of 25-year cycles of above or below average rainfall which influence recharge and therefore regional groundwater levels. The Tertiary Sands Aquifer is, in general, a confined aquifer. It receives some recharge from the overlying quaternary aquifer where the confining clay bed is thin or absent.

In the Musgrave Prescribed Wells Area, seven groundwater dependent ecosystems were identified. These were hypogean and hyporheic ecosystems, Sedge and rush communities in springs and soak wetlands, Sedgelands dependent intermittent inundation from groundwater, Phreaphytic redgum communities, Saline swamps and lakes, Sinkhole ecosystems, and Marine ecosystems.

The two key aquifer components that must be considered in making environmental water provisions for groundwater dependent ecosystems are the:

- storage component — the volume of water needed to keep the aquifer saturated; and
- discharge component — that water in excess of storage that discharges and supports many groundwater dependent ecosystems.

To meet the needs of groundwater dependent ecosystems both of these parameters must be protected. Protecting storage also helps buffer variations in storage due to rainfall-induced recharge fluctuations.

All groundwater dependent ecosystems, apart from marine ecosystems, are solely dependent on the Quaternary Limestone Aquifer. Hydrogeological assessments of data show that preserving 60 per cent of the mean annual recharge will protect both aquifer saturation and discharge processes in the long term. In the allocation plan, this percentage share has been set aside for the environment prior to allocation of other percentage shares for consumption.

Under the percentage share approach, consumptive allocations are determined after environmental water provisions are made. The consumptive allocations reflect the nature of the biophysical environment and the water resource. Resource users have a clearly defined property right that varies in its volumetric value annually depending on the rainfall of the previous 10 years. Each year at the end of October, the Minister issues a notice that effectively allows for calculation of the volumetric value of each percentage share for the next 12 months. This approach protects the resource for consumptive use and also the groundwater dependent ecosystems in a far more ecologically effective manner than would a volumetric environmental allocation.

The Tertiary Sands Aquifer is confined and is believed to discharge only to the seabed. There may be some seabed plant communities that have some degree of dependence on groundwater discharges although this is unknown. Because of its confined nature the critical parameter that must be protected so as to maintain discharge to any groundwater dependent ecosystems is the aquifer pressure. Pressure in confined aquifers is highly responsive to water extraction, especially in systems with limited recharge as is the case in the Musgrave Prescribed Wells Area. A highly precautionary approach has been adopted for this aquifer and 90 per cent of the mean annual recharge to the aquifer has been provided for the environment.

Other water resources

As noted in the second tranche report, there are a number of stressed river systems that are not prescribed under the Act but which are located in catchment water management board areas. These are principally within the Mount Lofty Ranges. Although water allocation plans are not required in these cases, these resources are addressed in relevant catchment water management plans. This level of planning is addressed in the section on environment and water quality.

These plans also assess environmental water needs, set out programs for monitoring river health, and set out methods for improving the health of water dependant ecosystems. As well as setting out management actions the board intends to implement, plans may also provide for the control of the construction of dams through a requirement for, and conditions on, permits. If the results of monitoring undertaken by the board indicate that closer management controls are deemed necessary, the resource may be prescribed in accordance with the Act.

Review of allocations

Catchment water management plans and local water management plans must be reviewed at least every five years, and the same applies to water allocation plans as a result of a policy decision in the State Water Plan. The Act requires water allocation plans and catchment water management plans to specify programs that will monitor the health of ecosystems. If the results of monitoring indicate that the resource is overallocated to consumptive use, then the mechanism for addressing this is through adjustments to the water allocation plan via the five yearly review process.

Discussion

National principles for the provision of water for ecosystems

The following discussion covers the ARMCANZ/ANZECC National Principles of Water for Ecosystems that are relevant to this assessment.

Principle 1: River regulation and/or consumptive use should be recognised as potentially impacting on ecological values.

The State Water Plan clearly recognises the potential impact consumptive use of water resources can have on ecological values. The continuing development of water allocation plans and catchment water management plans as well as implementation actions in these plans clearly recognise the potential and actual impact of river regulation and/or consumptive uses on ecological values. The Council is satisfied this principle has been met.

Principle 2: Provision of water for ecosystems should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.

South Australia uses ecological principles, best scientific knowledge of hydrology-ecology relationships, and flow manipulations to develop recommendations on environmental water provisions and water regime restoration. In all cases, temporal and spatial variability are taken into consideration.

Investigations to date have tended to focus on large permanent rivers. Ecological understanding of environmental water requirements for seasonal and episodic streams and groundwater-dependent systems is still in an early stage of development. These types of aquatic systems are common in South Australia. South Australia has advised that many water resources management problems are occurring in small systems where farm dams and small scale direct pumping or diversion is the major form of regulation and extraction.

Given the current state of knowledge, a range of approaches are being used to determine the water needs of the environment within a broader framework of adaptive management. These include flow percentiles, expert scientific panels, modified habitat assessment methods, a modified 'Petts' method and a modified New South Wales Nature Conservation Council method for assessing groundwater dependent ecosystems (see previous discussion).

In addition to the use of these methods, there are many research and investigation projects that have contributed enormously to the understanding of environmental water requirements in South Australian water-dependent ecosystems. The following are examples of these projects.

- Environmental flow requirements in Australian arid zone rivers project. This is a large-scale research project investigating the hydrology and ecology relationships in rivers of the Lake Eyre Basin. It will provide valuable knowledge and tools upon which to base water resources management decisions for arid zone rivers.

- Mid-North River Management Planning project has completed assessments of environmental water requirements for the Wakefield and Broughton Rivers.

- Onkaparinga Catchment Water Management Board is conducting a two-year study on environmental water requirements and environmental water provisions for the Onkaparinga River catchment. This study will integrate ecology, hydrology and socio-economic analyses.

- River Murray Catchment Water Management Board is conducting two projects. The first is to determine environmental water requirements for the temporary streams of the eastern Mount Lofty Ranges. The second is to develop an environmental flow decision support system for the River Murray in South Australia.

- South East Catchment Water Management Board is conducting a desktop study on environmental water requirements and provisions for groundwater-dependent ecosystems in the South East.

The Council is satisfied that South Australia continues to work to improve its knowledge, assessment and allocation methods to provide water for ecosystems. A detailed list is included under principle 11. The combination of research methods and projects constitutes 'best available' scientific information. South Australia continues to meet this principle.

Principle 3: Environmental water provisions should be legally recognised.

South Australia has given legal recognition to environmental water provisions through many sections of the *Water Resources Act 1997*. Under s16(2) of the Act, the water needs of ecosystems must be considered in determining the demand on the resource. All water plans produced under the Act and endorsed by the Minister are legally binding. The Council is satisfied that South Australia meets this principle.

*Principle 4: In systems where there are existing users, provision of water for ecosystems should go **as far as possible** to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.*

A number of sections of the Water Resources Act in combination address this principle.

The Act provides that once a resource is prescribed the Minister must prepare a report assessing environmental water needs as part of determining the capacity of the resource and assessing the level of existing consumptive use. Existing users are entitled to a licensed water allocation based on reasonable existing use or commitments for development. However, upon prescription, if the total allocations of licences issued to existing users exceeds the capacity of the resource, then the Minister may reduce consumptive allocations.

The Act also provides for the Minister to reduce allocations to prevent damage to, or further damage to water-dependent ecosystems.

Water allocation plans must 'balance the social, economic and environmental needs for water, and set a rate of use that is sustainable'. This clearly recognises existing consumptive users. Provisions in this section of the Act that sustain the ecological values of ecosystems include:

- monitoring provisions;
- five-yearly reviews of water allocation plans; and
- the power for the Minister to reduce allocations if ecosystems are threatened. The Act sets out a process to move toward ecologically

sustainable water use, if existing levels of water use are not considered sustainable.

The Council is satisfied that South Australia meets this principle.

Principle 5: Where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.

Previously South Australia has claimed the River Murray, the Barossa Valley and Clare Valley as its only stressed river systems. However, emerging evidence indicates that the Marne River could also be considered to be a stressed system. The Council notes that CoAG commitments required allocations to the environment in stressed and overallocated rivers by June 2001. The Council considers, given the process that South Australia is taking on stressed systems together with information becoming available on the allocation status of the Marne river system, that action to reallocate water to the environment should occur by 2002.

In the Council's second tranche NCP assessment, the Council noted that States and Territories would have to demonstrate substantial progress in implementing their agreed and endorsed implementation program for the 2001 assessment. Progress must include at least allocations to the environment in all river systems which have been over-allocated or are deemed to be stressed by June 2001. By the year 2005, allocations must be substantially completed for all river systems and groundwater resources identified in the implementation programs. The Council noted in its assessment that implementation programs could be changed over time — provided there is agreement between the jurisdiction and the Council.

In terms of the stressed systems program, South Australia is on track with substantial progress in developing water allocation plans as per the implementation program from the second tranche report. The Council is broadly satisfied that while South Australia is not implementing volumetric allocations for the environment, the water allocation plans are incorporating a range of measures set on a precautionary principle basis to deliver innovative and comparable results.

South Australia has identified the need for a review of its approach to stressed rivers. This is demonstrated in a number of plans the Council has examined, where South Australia has identified that further research work will be required before environmental water requirements can be implemented. For example, South Australia provided the Council with a copy of the Onkaparinga Catchment Water Management Plan. Among the key issues identified in this plan is 'Inadequate environmental flows due to dams, reservoirs, pumping, other diversions and obstructions' (Onkaparinga Catchment Water Management Board 2000, p. 49).

The plan outlines some proposed actions to address this issue. There will be an overview of dams in the area, flow patterns in each catchment

characterised and assessed, a strategy to improve water for the environment in the Onkaparinga River catchment, and an action plan prepared by 2005 for implementing environmental water requirements in negotiation with landholders and other relevant parties.

To achieve this, the Onkaparinga Catchment Water Management Board is conducting a research project to determine the environmental water requirements due for completion by June 2003. South Australia has advised that this work is a forerunner to similar studies for other major Mount Lofty Ranges catchments.

Broadly the Council is satisfied that the actions in the process identified above will lead to improvements in the condition of the streams in the catchment. However, the Council is concerned that any likely resolution to achieving appropriate flow regimes is still a few years away and may extend beyond 2005. While supporting the need to adopt the best scientific information available in plans, the Council does want to sound a note of caution with regard to the timeframe to implement these provisions and the need to ensure that South Australia meets its commitment to address its implementation program in full by 2005.

There is also the need for better data to determine whether there are issues of overallocation in some systems in South Australia, particularly with regard to catchments in the Mount Lofty Ranges. That said, the McLaren Vale Prescribed Wells Area water allocation plan provides for groundwater allocation in excess of the sustainable yield up to July 2003 as a transition period before allocations are decreased through a process of reallocating water rights to the level of the sustainable yield.

The Council will report on further developments and conduct another assessment of South Australia's progress in this area in June 2002. The Council is satisfied that South Australia meets this principle for this assessment.

Principle 6: Further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (i.e. ecological values are sustained).

This is a requirement of the *Water Resources Act 1997* and provided for in the policy directions set out in the State Water Plan. One of the core values of the State Water Plan 2000 is that the State's water must be managed and used according to the principles of ecologically sustainable development.

For example, the Marne River has been recognised by South Australia as a resource that is likely to be under some degree of stress. A notice of restriction was issued in May 1999. This prevents any additional water extraction for two years during which time investigations into water use and better quantification of the water resource would occur. Due to ongoing investigations, this notice was extended for a further two years in May 2001. The River Murray Catchment Water Management Board is conducting a

project investigating environmental water requirements for a number of eastern Mount Lofty Ranges streams including the Marne River. The results of this project should form part of a report on the capacity of the resource as required by the Water Resources Act if the Marne River is prescribed.

The Council is satisfied that South Australia is meeting this principle.

Principle 7: Accountabilities in all aspects of management of environmental water provisions should be transparent and clearly defined.

In areas covered by catchment water management boards, the boards are responsible for day-to-day management of environmental water provisions, in accordance with catchment water management plans or water allocation plans. Licensing functions have yet to be delegated by the Minister to any boards, and so the granting, review and transfer of licenses remains the responsibility of the Minister.

Boards are accountable to the Minister and must report to the Minister each year on the extent to which:

- the board has succeeded in implementing its catchment water management plan; and
- implementation of the plan has succeeded in achieving the ecological sustainable development objective of the Act.

The Minister is required to table this report in Parliament. Outside of board areas, the Minister is responsible for the day-to-day management of environmental water provisions for prescribed resources. The Minister must report to Parliament annually on the extent to which:

- the State Water Plan has been implemented; and
- implementation of the State Water Plan has achieved the object of the Water Resources Act.

The civil remedies provisions of the Water Resources Act 1997 allow the Environment Resources and Development Court to grant leave to persons not directly affected by a breach or potential breach of the Act, to take action in the Court to prevent that breach. This would allow environmental groups to take action to protect the environment.

The Council is satisfied that South Australia has met this principle.

Principle 8: Environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.

The Water Resources Act establishes an adaptive management framework that requires monitoring, evaluation and review of water plans.

The Act requires water allocation plans and catchment water management plans to specify programs that will monitor the health of ecosystems. Water allocation plans have been prepared for all licensed water resources, and the plans identify water dependent ecosystems and monitoring requirements for these ecosystems. Catchment water management plans also establish water requirements of ecosystems across a catchment or region and the water monitoring requirements to assess and monitor the condition of these ecosystems. These plans identify research and investigation programs to address information or data gaps on many ecosystems. The boards are responsible for implementing these monitoring networks in conjunction with the State agencies.

South Australia is conducting a State Water Monitoring Review to develop an integrated water monitoring program based on a range of indicators including those which will identify the state and condition of the resources, the current and potential impacts or threats to these resources and the success of management initiatives.

This review is attempting to incorporate proactive (or leading) indicators into monitoring programs, for example, the use of land use data to monitor the potential impact of land use change trends on surface and ground water quality, as well as water quality and the ecological condition of aquatic ecosystems. This information will be used to prioritise and target management initiatives and future monitoring programs. The review is expected to determine an indicator or index of overall stream condition that will integrate assessments of water quality, quantity, riparian condition and stability and ecological health for streams across South Australia.

The review links into the monitoring and evaluation requirements of the State Water Plan to provide a framework for the implementation of the State Water Plan and catchment water management plans.

The Council is satisfied that South Australia is continuing to meet the requirements of this principle.

Principle 9: All water uses should be managed in a manner which recognises ecological values.

The object of the Water Resources Act 1997 requires that all water be managed in a manner that recognises ecological values including the protection of water-dependent ecosystems, and their biological diversity.

The State Water Plan has the goal of managing water dependent ecosystems so that the condition of these ecosystems is maintained or improved and that long term integrity of the ecological functions and dependent biodiversity is ensured. The State Water Plan has as a principle that:

> *… water allocation and management decisions must take a precautionary approach by first ensuring that natural ecological processes and biodiversity of water dependent ecosystems are*

> *maintained. It follows that further allocation of water for new consumptive uses, and any other new water resource developments, must ensure that ecological values are protected.* (DWR 2000a)

The State Water Plan also contains principles for managing riparian zones and wetlands. For riparian zones, the principles include:

- protection of refuge areas and maintenance of water connections up and down the watercourse must be given priority due to the high flow patterns of many of South Australian watercourses;
- all planning and works programs need to protect identified ecological values of riparian zones; and
- riparian zones in public water supply catchments must be managed to protect water quality and restore ecological values.

For wetlands, the principles require management to aim to provide adequate water of appropriate quality to maintain wetland functions and ecological values.

South Australia has met the requirements of this principle.

Principle 10: Appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.

To cover the costs of externalities, catchment water management boards charge for the costs of works through a land based or water based levy. The South Australian Water Corporation contributes a minimum of 0.5 cents per kilolitre to each of the relevant catchment water management boards in the form of ex-gratia payments for water extracted in the board's area. This provides an environmental externality to the cost of all reticulated water supplies. Sewerage charges also incorporate a levy for environmental impacts.

The Council is satisfied that South Australia is meeting this principle.

Principle 11: Strategic and applied research to improve understanding of environmental water requirements is essential.

South Australian agencies are continuing to conduct a number of research and investigations projects. These include:

- scientific panel established for the River Murray Barrages;
- scientific panel for the Lower River Murray;
- research on the effects of headworks on biological communities in the Mount Lofty Ranges;

- investigations into opportunities to flood River Murray wetlands using the existing weirs;
- recent weir pool manipulation trials on the River Murray;
- trials to manipulate the hydrological regime for wetlands along the River Murray;
- development of a decision support tool for River Murray wetlands;
- the Aridflo project that is developing a model of hydrology-ecology relationships for arid zone rivers;
- investigations into environmental water requirements in the Eastern Mount Lofty Ranges;
- South-East Wetlands Waterlink project; and
- research projects on the environmental water requirements of the Gawler, Wakefield, Broughton, Onkaparinga and Light Rivers.

The Council is satisfied that this principle continues to be met.

Principle 12: All relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions.

The Act prescribes a detailed community consultation process for the development of water allocation plans, catchment water management plans, and local water management plans that identifies all relevant stakeholders. These plans are subject to full public consultation (see public consultation and education section). South Australia has met this principle.

Assessment

For this assessment, the Council is looking for governments to demonstrate 'substantial progress' against their implementation programs on the ground. By substantial progress, includes at least allocations in all river systems which are over-allocated or deemed to be stressed. The implementation programs are to be substantially completed by 2005 for all river systems and groundwater nominated.

The Council applauds the initiatives to meet the needs of the environment contained in the Clare Valley Prescribed Water Resources Plan and the Musgrave Prescribed Wells Area as appropriate to addressing the types of systems that characterise South Australia. The Council is particularly impressed with South Australia's approach to groundwater dependent ecosystems and notes South Australia's pioneering work in this area.

However, South Australia has acknowledged that the approach used to identify stressed water resources to date has been based on assessments of development pressures on the resource rather than the state of ecological health. At this stage, the nature of the relationships between hydrology and ecology is unclear in the temporary and ephemeral streams that characterise South Australia. South Australia therefore has responded proactively based on pressure indicators. In the River Murray and some groundwater systems, 'state-type' indicators such as salinity and water level, have been used to identify resources under stress. South Australia argues that this is the most effective approach for these systems, as South Australia does not have the large, regulated systems of the eastern States that are suited to volumetric environmental water allocations.

South Australia has identified the need to improve current knowledge of environmental water needs and definitions of stress as a key area that requires attention. It will conduct a stressed resources assessment review as called for by the State Water Plan, and advise the Government on a process that identifies water resources under stress, or at risk of stress and appropriate management responses during 2001.

South Australia has implemented a significant number of water allocation plans and, as a result, is ahead of a number of jurisdictions in finalising a sizeable number of robust plans. However, a number of plans the Council examined such as the Onkaparinga Catchment Water Management Plan indicate that further research work will be required before environmental water needs will actually be implemented in accordance with the plans. As outlined above, there are many investigations and research activities occurring in South Australia in response to this need. For example, the Onkaparinga Catchment Water Management Plan notes that there are inadequate environmental flows due to dams, reservoirs, pumping, other diversions and obstructions. The plan calls for a research project into the environmental water requirements project to be completed by June 2003. By 2005, an action plan is to be prepared including flow patterns in each catchment and a strategy to improve water for the environment in the Onkaparinga River catchment.

While supporting the need to adopt the best scientific information available in plans, the Council does want to sound a note of caution with regard to the timeframe to implement these provisions and the need to ensure that South Australia meets its commitment to address its implementation program in full by 2005.

Given South Australia has virtually completed the establishment of water allocation plans that are legally binding under the Act, the Council is satisfied that South Australia is making satisfactory progress against the implementation timetable and has met all reform commitments for this assessment. The Council will report on further developments with regard to South Australia's progress, including the stressed resources review, in the 2002 NCP assessment.

Water trading

Governments have agreed that water trading arrangements should be in place to so as to maximise water's contribution to national income and welfare, within the social, physical and ecological constraints of catchments (clause 5).

Scarcity of unallocated water combined with growing demand from industries such as viticulture has created a strong demand for water trading in some parts of South Australia. Evidence is already available suggesting that trade in water rights is delivering significant benefits to both buyers and sellers. The High Level Steering Group on Water notes that:

> *The South Australian position provides a good indication of the varied situation for water trading. In some areas, major progress has been achieved in implementing trading arrangements while in others, more work is needed to resolve water trading issues.* (High Level Steering Group on Water 2001, p. 1.9)

Constraints on more widespread trading include:

- geological and hydrological factors;
- community concern;
- a high percentage of water is tied into permanent plantings; and
- administrative impediments.

Trading within South Australia

As discussed in the preceding section on water allocations, the *Water Resources Act 1997* (the Act) provides a mechanism for prescribing stressed water resources where the condition of the resource or the level of use suggests that closer management is necessary. Under the Act, water rights are issued to water users in prescribed areas through a licence and an accompanying allocation entitling the licensee to a share of the available resource. Licences must be issued consistent with the relevant water allocation plan.

Unregulated

As noted in the second tranche assessment, temporary and permanent transfer of property rights was first introduced to South Australia in 1983. Today, a legislative base for trade between licensed private diverters in

prescribed areas is provided by Part 5, Divisions 2 and 3 of the Act. This Division applies to private diverters not participating in an irrigation scheme.

Part 5 of the Act provides for a licence and all or part of the allocation attached to the licence to be transferred to another licensee subject to Ministerial approval. The application for the trade must be in the prescribed form and be accompanied by the fee prescribed in regulation. The Minister may also direct that an expert approved or appointed by the minister undertake an assessment of the effect of granting the application.

South Australian legislation allows people to hold licences without the ability to use the allocation attached to it through a water 'holding' allocation as opposed to a water 'taking' allocation. A holding licence allows people to hold water but not use it without first transferring it to a water taking licence.

The Act provides for the establishment of a register of water property rights. All parties listed as having an interest in the licence as indicated by the water register must be notified of an application to trade before the Minister can grant approval. These parties may then make a representation to the Minister in regard to the proposed transfer. In reaching a decision the Minister must ensure that:

- the transferred allocation and conditions placed on the licence be consistent with the relevant water allocation plan; and

- the trade is in the public interest.

The Minister may reduce the allocation of the transferred licence or vary the conditions of the licence before approving the trade. The Minister's decision may be appealed.

Regulated

Section 34 of the *Irrigation Act 1994* provides for irrigation scheme participants and to sell all or part of their allocation to other scheme participants or the scheme authority. All such trades are subject to the approval of the authority and payment of the prescribed fee.

Trade between private diverters and participants in irrigation schemes is also facilitated through The *Irrigation Act 1994*. Water rights within most irrigation areas are provided to irrigators through the irrigation authority. The Authority is given a taking allocation, through which it then provides a water right to irrigators. This right is freely transferable within the scheme, and it is possible to trade outside the scheme through the authority. The only exception to this rule is the Renmark Irrigation Trust, which retains the water right and provides bulk water services to irrigators on a fee for service basis. The Renmark Irrigation Trust is managed under the *Renmark Irrigation Trust Act 1936*.

The Act also enables an irrigation authority to trade all or part of its surplus allocation (that allocation held by the authority in excess of the sum of allocations held by individual participants) to another to a party outside the scheme. However, these trades are subject to:

- a resolution being made by the irrigation trust. Twenty-one days notice must be given;
- 'excess water' must be traded before 'unused water';[9] and
- following deduction of the costs relating to the transfer, the proceeds from the sale must be divided among scheme participants with the allocation mechanism depending on whether the water is 'excess' or 'unused water'.

Institutions and policies

As outlined above, current arrangements enable trades involving participants in the State's irrigation schemes and private licence holders within the State's 19 prescribed resources. The Minister currently responsible for applying the provisions of the Act is the Minister for Water Resources.

Trading rules are developed for individual prescribed resources in consultation with the community as part of the water allocation plan process.[10] The Council understands that the trading rules provided by a plan must be consistent with the State Water Plan which has been prepared to operationalise the objectives of the Act.

State Water Plan 2000

In considering the opportunities facing South Australia, the State Water Plan 2000 notes the potential for improved to operation of water allocation transfer market to facilitate further development of fully allocated resources such as the River Murray and South East groundwater resources.

In regard to watercourses and other surface water the State Plan notes that:

- the nature of South Australia's highly variable surface water and watercourse water resources will generally mean that water rights may be transferred downstream in a catchment but not up stream; and

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9 'Excess water' is water that a trust is entitled to under its allocation under the Act that exceeds the aggregate of the water allocation of the irrigated properties comprising its district. 'Unused water' is the quantity of water by which the water that a trust expects to supply in the future to its irrigated properties falls short of the aggregate of the those properties.

10 This process is discussed in detail in the previous sections on allocations and provision for the environment.

- transfers between catchments is generally not supported due to potential environmental impacts. However, transfer of water is supported if its is within the ecological limits of the taking and receiving environments.

Similarly, in relation to groundwater trading, the following principles are adopted where transfers are not permitted:

- between management zones (which may include aquifers) unless specifically provided for within the water allocation plan;

- to areas of high intensity extraction unless a detailed hydrological assessment and a monitoring program suggests minimum risks to the resource and any groundwater dependant ecosystems; and

- unless they have positive or neutral water effect quality outcomes, consistent with the higher value uses required of the water bodies.

Water Allocation Plans – regional trading rules

Trade is possible in any prescribed resource where licences have been issued. There are rules for trade in each of the water allocation plans that have been completed, with provision made in each of the drafts that have yet to be adopted.

Each of the water allocation plans clearly establishes trading rules and areas where trade may occur (an example is provided in box 4). This is generally done through the adoption of objectives and principles for the transfer of water rights. These objectives and principles are made on the basis of the environmental requirements and to protect the long term sustainability of the resource and third parties.

Box 4: An example of water allocation plan transfer criteria: North Adelaide Plains

Objectives

1. minimal impacts on the underground water resource, or the productive capacity of land from the taking and use of water;
2. efficient use and management of water;
3. sustainable use of the underground water resource;
4. maintenance of water quality;
5. maintenance of underground water dependent ecosystems; and
6. maintenance of the integrity of the aquifers.

Principles:

1. transfers of licences and/or allocation shall not be permitted where the taking and use of the water transferred is likely to have an adverse impact on:
   a) the integrity of the aquifer;
   b) the quantity and quality of water in the aquifer;
   c) any underground water dependent ecosystems;
   d) existing users of the resource; or
   e) the productive capacity of the land.
2. transfers of licences and/or allocation shall not be permitted where the transferred water allocation will be taken from a well in a different aquifer, unless there is hydrogeological evidence to demonstrate that there will be an overall benefit to the underground water resource; and
3. transfers of licences and/or allocation shall not be permitted where the transferred water allocation is from an area of high potentiometric surface to an area of low potentiometric surface, unless there is hydrogeological evidence to demonstrate that any negative impact on the underground water resource is negligible.

Source: Northern Adelaide and Barossa Catchment Water Management Board 2000a

Trading to date

The September 2000 State Water Plan noted that prices paid for the transfer of water over the last decade have doubled, indicating the higher value now placed on water as an input to development. The State Plan also notes that the allocation and transfer market and redevelopment have achieved a more productive use of the allocated water.

Indicative water prices for permanent transfer of water rights for River Murray and South East Groundwater resources range from $800 to $1200 per megalitre but can be five times this in areas of shortage where high value crops are grown (South Australia 2000).

In looking at the current status of water trading in South Australia, the High Level Steering Group on Water noted that in some areas major progress has

been made in implementing trading arrangements, while in others more work is needed to resolve water trading issues.

For example, the High Level Steering Group on Water report noted that in the Barossa Valley innovative water trading policies together with third party access and other CoAG reforms have facilitated significant high value development that would not have otherwise occurred due to local resource constraints.

Similarly, introducing transferable water entitlements in the Highland Irrigation Areas enabled property owners to realise the true value of their water and land assets separately. The High Level Steering Group on Water report also noted that trade has helped provide a path for those locked into unsustainable properties to leave the industry with the remaining irrigators being able to rehabilitate many of the remaining 'retired properties' with new rootstocks, irrigation systems and other efficient practices.

The High Level Steering Group also noted that there has been considerable community resistance to trading in the Mallee Prescribed Wells Area. The South Australian 2001 Annual Report noted that similar concerns were impeding trade in the Eyre and the southeast regions of the State.

In the North Adelaide Plains Prescribed Wells Area past water use has led to a significant decline in groundwater levels and increasing levels of groundwater salinity. Temporary trade has seen water move to more productive areas but the resulting increase in demand in those areas has lowered aquifer pressure and water levels increasing the potential for salinity problems. Consequently tight controls have been placed on trading to ensure that water is not traded into areas of localised water decline or rising salinity.

Trade has also been used to reduce allocations in this area as part of efforts to achieve more sustainable use. Previous policies have required between 10 and 70 per cent of the water allocation traded (depending on whether the trade is a irrigation or industrial transfer) to be returned to the resource. The draft Water Allocation Plan proposed that 20 per cent of the volume of water trades be returned to the resource. However, this reduction was not implemented in the final plan.

Water availability in the North Adelaide Plains Prescribed Wells Area has also been assisted by reclaimed water from the Bolivar Sewage Treatment Works. The South Australia 2001 Annual Report stated that this resource is progressively being allocated and some limited trade is already being observed.

Interstate trade

Institutions and policies

South Australia's 2001 NCP Annual Report notes the State is participating in the Interstate Trading Pilot Project being co-ordinated by the Murray-Darling Basin Commission.[11]

Interstate trading

South Australia noted that as at September 2000 all but six of the 51 interstate trades facilitated through the Interstate Trading Pilot Project were trades into South Australia. In net volume terms this involved 8.8 gigalitres or 90 per cent of the total volume traded. Further information on the number, volume and direction of trades for Victoria conducted under the Pilot is available in the Murray-Darling Basin Commission assessment.

Only one trade resulted in the movement of water out of South Australia. Information provided by the *Inter-state Water Trading: A two-year review* (CSIRO 2000) suggests that high prices in South Australia relative to the other participating states was a major factor driving the movement of water allocations into South Australia. Increasing demand resulting from the significant growth in the wine industry combined with limited availability of additional allocations in South Australia has lead to higher water prices relative to the upstream parts of the Pilot Project zone. For example, the two-year review stated that prices of over $10 000 per megalitres have been recorded in McLaren Vale while the River Murray licences were trading in the $1000 to $1150 per megalitre range. This is compared to an upstream range of around $750 to $1000 per megalitre.

The High Level Steering Group noted that pilot trades into the Barossa valley have led to:

- water moving to higher value use;
- environmental benefits due to water being diverted from further down stream;
- more efficient use of pipeline infrastructure; and
- the creation of significant development and employment opportunities in an otherwise 'fully developed' Barossa Valley.

[11] The mechanisms supporting the Pilot are discussed in more detail in the Murray—Darling Basin Commission assessment

However, the review also identify a number of issues that are impeding both interstate and intrastate trade. These matters are discussed further below.

Supplementary information provided by South Australia notes that in addition to the River Murray, the State's other main shared resource is the Great Artesian Basin. However, there are currently no formal entitlement systems or comparable management systems and interstate agreements on the management of the Great Artesian Basin are still in their early stages. South Australia conclude that there are many other issues including technical feasibility to be addressed before trading can be considered.

Discussion

Consistent with commitments under the CoAG framework, the objective of water trading is to ensure water is used to maximise its contribution to national income and welfare, subject to the physical, social and ecological constraints of catchments.

In making its assessment, the Council recognises that the means through which jurisdictions achieve these reforms will vary. However, to provide a consistent basis for assessment, the Council has evaluated the arrangements in each jurisdiction against a common set of key criteria, which are consistent with recent work by the High Level Steering Group on Water (2001).

As trading in most jurisdictions is still in its infancy, the assessment has focussed on the establishment of mechanisms, policies and information that provide a sound foundation for efficient water trading. Particular focus in this assessment has therefore been extended to:

- the clear definition of sustainable water rights;
- adequate specification of appropriate trading rules and zones;
- appropriate market procedures; and
- accessible and equitable market information.

In future assessments, the Council will look for evidence of effective trade in areas of demand and measures to be in place to increase the depth of water trading markets.

The clear definition of sustainable water rights

South Australia's progress on these issues has previously been discussed in the section on allocations and property rights. Discussion here will focus solely upon the impact of these issues on the efficacy of interstate and intrastate trading markets.

Nature of the right

In South Australia, water licences specify the volume of water able to be taken and the conditions of use. Reliability and quality are not specified on the licence but can be dealt with through the relevant water allocation plan consistent with the broad objectives provided by the State Water Plan. Licence conditions are listed on the licence. The discussion on allocations concludes that there is sufficient specificity in South Australia's water rights.

Ownership

The ownership of the right defines the ability of the owner to realise the benefit of the right. It is generally defined by the quality of title and by the duration, enforcement and transferability and divisibility of the right.

As discussed earlier under allocation, water rights are made in South Australia through the issue of licences.

Water licences are vested in the end users and are specifically recognised as personal property. This allows for the simple and efficient transfer of water rights.

In most regulated systems, the irrigation authority holds the water taking allocation and provides a share of this allocation to individual irrigators. This right is freely transferable within the scheme and is able to be traded outside the scheme through the authority. The only exception to this rule is the Renmark Irrigation Trust, which retains the water right and provides bulk water services to irrigators on a fee-for-service basis.

A number of factors affect the certainty of ownership of South Australian water rights (see allocation section for more detail). These include the:

- Minister keeps a physically available register of water rights that prevents dealing in the licence without notification being given to a person with an interest in the licence;

- the water allocation planning process provides a sound basis for sustainable use of the resource and includes appropriate stakeholder involvement. However, under current arrangements, the State Water Plan or water allocation plan must be reviewed within the five-year period. A review such as this could lead to a reduction in allocations without compensation, as no provision is made for compensation within the Act. Because the risk of change is low this is unlikely to provide a disincentive to trade; and

- there are strong provisions to enforce water rights. In regulated irrigation districts, a person who takes water from the irrigation or drainage system of a government or private irrigation district without being authorised to do so or uses water taken from an irrigation system for an unauthorised

purpose is guilty of an offence (see table 9). The maximum penalty is set at $5000.

The Council understands that concerns exist that penalties for non-compliance with licence conditions are currently low relative to other States and, more importantly, relative to the market price for water (CSIRO 2000). This creates a significant incentive for non-compliance and unsustainable water use, as water users may be encouraged to breach licence conditions rather than pay for additional water entitlement. The Council suggests that this issue has the potential to undermine the substantial efforts of South Australia towards more sustainable water use and efficient trade should be addressed as a matter of urgency.

Table 9: Penalties for overuse of water in 2000-01

Region	*Penalty for over-extraction*
Northern Adelaide Plains	21 cents per kilolitre for excess use up to 15 per cent of allocation
	97 cents per kilolitre for excess use in excess of 15 per cent of allocation
River Murray and Angas Bremer	5 cents per kilolitre for excess use up to 10 per cent of allocation
	10 cents per kilolitre for excess use between 10 and 20 per cent of allocation
	26 cents per kilolitre for excess use in excess of 20 per cent of allocation
Barossa	97 cents per kilolitre for all water taken in excess of allocation
Taking without a licence	$2 cents per kilolitre for water determined or assessed to have been taken

Source: South Australia 2000

South Australia has noted that penalties are currently being revised due to he introduction of new water allocation plans. The revised penalties are intended to reflect the market price of water. This will promote trade in allocations to avoid overuse penalties.

It is also possible to hold a water licence and allocation without the ability to use that water through a water 'holding' allocation. This streamlines the process of buying and holding water by persons other than water users, as there is no attachment to land or environmental clearances. A 'holding' allocation must be transferred to a 'taking' allocation before it can be used.

The Council is satisfied that property rights are sufficiently well specified and clear in ownership to provide for efficient trade.

Sustainable rights

In terms of interstate trade, the two-year review notes that most of the water being transferred to South Australia is being applied to land that has not

previously been irrigated, with the consequence that river salinity may increase. On this, the review noted that, 'The Trial's aim to ensure that inter-state trading does not "result in increased levels of salinity" is not guaranteed' (CSIRO 2000, p. 43).

The review also noted that South Australia has been put on notice[12] that, as far as interstate trade is concerned, it may not be living up to its obligation to have a neutral river salinity impact.[13]

Monitoring and enforcement of Irrigation and Drainage Management Plans and salinity prevention obligations was identified by the review as a key consideration in terms of the effectiveness of the new arrangements. However, some reservations were also expressed as to the effectiveness with which this will occur. For example, the Review comments that in both South Australia and New South Wales a lack of Departmental resources inhibits proper review of the approval and compliance process. The review also suggests that South Australia will be in a better position to enforce irrigation and drainage management plans when they are linked in a statutory sense to water allocation plans.

The South Australian Department for Water Resources is currently implementing a licensing condition that approval to use all traded water is subject to the completion of a Irrigation Drainage and Management Plan that includes a zero impact assessment to determine an irrigators future salinity prevention obligation. This obligation outlines the water purchaser's financial and management obligations to offset any salinity impacts over time. For instance, purchasers have agreed to plant trees, plan for remediation or set aside funds before receiving approval. Salinity prevention obligations apply to all water traded in South Australia, not just water traded from interstate. South Australia has also advised that these requirements are generally extended to temporary trades or leases of longer than three to five years in recognition of the increasing popularity of leases and the risk of environmental degradation from the long-term temporary transfer of water rights.

Water trading zones and rules

Trading will only occur in areas where the resource is scarce relative to the demand for it. Thus, the fact that trading is only possible within prescribed areas in South Australia does not appear to be a significant issue given that

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12 Negotiation for the inclusion of South Australia on the MDBC Salinity and Drainage Strategy Register are in the final stages and are expected to commence with a 30 Electrical conductivity units debit to South Australia.

13 The Review also noted that same can probably also be said of the other States but as yet there have been few trades in this direction and little that has involved the removal of irrigation from an area.

prescribed areas appear to cover all those resources that are scarce relative to demand. Also, as discussed previously, the Council is satisfied that should demand in a non-prescribed area increase then appropriate monitoring arrangements are in place to ensure that, as appropriate, the resource will be prescribed and trading will take place.

Water allocation plans are providing a clear mechanism for setting trading rules. Each of the plans follows the same structure and clearly identifies which areas and resources are included within the prescribed resource, who can trade and the transfer criteria which govern this trade. Maps are provided where relevant. The Council considers that water trading zones and rules are clearly established in South Australia.

Constraints on trade

Reduction factors have been mooted as a mechanism to reduce allocations to a more sustainable level. The High Level Steering Group on Water identified the draft water allocation plan for the North Adelaide Plains Prescribed Wells Area was one example where this was suggested. In examining the final plan, however, the Council notes that the reduction factors were not included.

The Council supports the South Australian Government's efforts to move allocation levels to a more sustainable level. The Council also acknowledges that this process can have a significant impact on water users. However, water trading could more appropriately be used to assist this process rather than being constrained by it.

The High Level Steering Group notes that reduction factors are ineffective in that they tax trade, which has the result of limiting water trade rather than use.

A range of alternative methods could be used to reduce water uses. These include:

- the government entering the market and buying water; and
- a uniform percentage reduction across all water users (the Council understands that this mechanism has been adopted in the McLaren Vale Prescribed Wells Area).

The Council also notes the existence of limitations on the volume of water that may be transferred out of an irrigation district in a given year. The Central Irrigation Trust has placed a 2 per cent limit on the proportion of total entitlements that can be sold out of a given district in one year. They argue that this ensures a slower and thereby more orderly process and allows irrigators and district authorities to adjust to changing circumstances.

The Council recognises that this restriction is in place due to community concern that excessive water trade out of a district may result in:

- a negative impact upon local production;
- reduction in the rate base for local governments;
- corresponding regional decline; and
- the loss of economies of scale for irrigation infrastructure, with remaining members required to assume a greater proportion of the fixed costs[14].

However, the Murray-Darling Basin Commission also notes that while these arguments have validity, interstate trading to date has largely been limited to the transfer of unused water. Indeed, a significant number of sellers we interviewed indicated that they had used this money to increase the area they irrigated bringing new investment and new employment opportunities to the district.

Where restrictions such as a percentage limit on the volume of trade out of an area are used, the Council will:

- look for evidence that it does not result in a significant impediment to trade (for example, the Council would consider frequency with which the rule is activated and at what point in the trading year it was activated, the back log of demand the following year and likely significance of foregone trades);
- consider the action resulting from activation of the rule — for example, whether trading is halted for the rest of the year, or some shorter cooling off period (as with stock exchanges) or whether a review is initiated; and
- look for the threshold for triggering an embargo on trade to be increased or phased out over time.

The Council will reconsider this issue in future assessments to ensure that trade is not being unduly impeded, particularly in terms of the effects on trade of the trade ceiling and reduction factors.

Markets and trading procedures

Measures provided by South Australia to protect the interests of market participants include:

- the registry and protocols showing whether a seller can holds title for the volume of water they are proposing to sell and who has an interest in the water right (for example, a bank);

[14] Also known as 'stranded assets'.

- buyer checks on delivery capacity, site use and compliance with relevant water allocation plans and environmental criteria; and

- standard documentation available on the internet.

Through these processes, the level of risk for buyers and sellers is reduced. The Council is satisfied that risk to market participants does not pose an undue impediment to trade.

Mechanisms to protect the interests of third parties such as the environment and other participants in an irrigation scheme include:

- all trades must be approved by the Minister who must take the relevant water allocation plan and the broader public interest into account;

- the registry that protects the interests of third parties such as banks; and

- trades are subject to the completion of an Irrigation Drainage and Management Plan, which entails a zero impact assessment for salinity.

The Council is satisfied that the market and trading procedures in South Australia are sufficient to manage the risk for market participants and third parties, including the environment.

Market choices

The Council understands that transfers in South Australia may be effected either through private trade, brokers or through a water exchange (where available).

The Central Water Exchange has operated by the Central Irrigation Trust since the 1999-2000 irrigation season using a sealed double bid process. The exchange has only dealt with 3000 megalitres of a total entitlement in the region of around 120 000 megalitres (Bjornlund and McKay 2001). Interstate parties could list to buy, although none have to date, but only a Central Irrigation Trust member can list to sell a water right. As well as permanent transfers, the exchange offers one, three, five and 10-year leases as standard products.

In relation to interstate trade, the two-year review noted that brokers were involved in all of the interstate trades involving legally separate entities with most trades involving different brokers operating from the buyer and seller (CSIRO 2000). There are no publicly available schedules of ethics or guidelines for exchanges or brokers. The Council is satisfied that there are few impediments to the entry of brokers and other exchanges to the market and that, as trade becomes more widespread, market choices will improve. The Council is satisfied that market choices do not pose an undue impediment to trade in South Australia in the context of this assessment.

Market information

Market information is important for an effective water trading market. This is supported by the State Water Plan, which notes that:

> *information on who has water, how much they are using and what the market price is for the transfer of water, is also essential to an effective market.* (DWR 2000a, p. 59)

The High Level Steering Group noted that currently a lack of data has disadvantaged poorly informed sellers to the advantage of better informed buyers. The report also noted that this is a special problem for private diverters who have poorer access to market information than irrigators operating within schemes.

The South Australian 2001 NCP Annual Report noted that up-to-date information is readily available to the public through the Department of Water Resources intranet, and the public has access to this system through any of the water licensing or regional offices, or over the telephone. This allows people to view a copy of the licence and all licence information. Water brokers frequently use this service.

Information is also an important part of countering community resistance to water trade where this resistance is based on misperceptions of the impacts of trade. Information and education about the real as opposed to perceived implications of trading is an important factor in reducing this impediment.

The High Level Steering Group stated that the benefits of trade have been forgone in the Mallee Prescribed Wells Area as a result of considerable community opposition to water trading. This opposition appears to stem from the perception that the windfall gain provided to right holders who received their licences free once trade is introduced is inequitable.

South Australia's 2001 NCP Annual Report echoes the High Level Steering Groups view that community concern has constrained trade, but also notes that a recent substantial trade has generate considerable interest in the Mallee Prescribed Wells Area which may facilitate greater trade. This illustrates the importance of spreading information about the benefits trade is already delivering both within the local region and elsewhere.

There is also community opposition to water trading policies in the Eyre Region of the State. However the State also claims that the Eyre Region. However, the Eyre Region Water Resources Planning Committee is working with the community and agency staff to resolve this issue.

Similarly, for the southeast region of South Australia, the water market is very thin and the community remains divided on the merits of water trading. To promote trade in this area a consultancy report titled 'Opportunities to improve water trading in the South East of South Australia' was released in November 2000.

The Council is satisfied that market information is available in South Australia. However, information availability could be improved, particularly in terms of price discovery and other financial information.

Certainty, confidence and timeliness

The certainty of water allocations in South Australia is good. South Australia is guaranteed a fixed volume of water each year in the as a part of the Murray—Darling Basin Agreement. As such, water users that utilise water from the Murray can expect to access their right in full each year. The majority of other water users access water from groundwater sources that are not dependent upon variable climatic factors for their supply. As such, changes in security are generally not a consideration.

The Council notes that many of the surface and groundwater prescribed areas are fully allocated (see section on allocation and the environment). In the McLaren Vale Prescribed Wells Area water allocation plan, for example, a reduction of 15 per cent of allocations will be required to promote sustainability. This reduction has been scheduled to occur in July 2003. The Act does not contain provisions for compensation of rights in instances such as this, although advanced warning helps people to adjust. To improve the certainty of allocation and trading processes, South Australia will:

- review water plans at least every five years in accordance with adaptive management principles that regularly takes into account new information;
- work with local government in areas where there is no catchment water management board to promote the introduction of integrated management of waterbodies and water-dependent ecosystems in either local water management plans or development plans;
- assume a precautionary approach to determining sustainability**;**
- convert all water allocations to a volumetric basis and measure all water use; and
- provide publicly available information on water allocations.

The time taken to make a permanent transfer, in particular, is often seen as an impediment to the efficient trade of water rights. The two-year review (CSIRO 2000) noted that the time taken to process has, in some cases, posed a significant social cost. For example, in some cases, special and awkward financial arrangements had to be put in place until the trade could be approved and funds exchanged. While noting that approval processes invariably require a thorough assessment for each particular case, the Council considers that the timely processing of trade applications and assessments is important for efficient trade.

To streamline this process, South Australia has created holding allocations as well as the usual taking allocation. This allows water to be traded without the

usual delays for environmental and other clearances associated with a taking or use allocation. On this matter, the two-year review noted that:

> *The pilot [sic] experience does not provide evidence suggesting that the holding licence influences the direction of trade, but it does provide evidence that it speeds up the trading process.* (CSIRO 2000, p. 30)

The Council will look for evidence of improved timeliness in its next assessment.

Capital efficiency

Capital efficiency provisions are well established in South Australia. Water entitlements have largely been separated from land and are freely transferable. In addition, the development of 'holding' allocations allows an allocation to be purchased without the ability to use that allocation and the need to go through complex clearance processes. This allows banks and other financial institutions to easily obtain ownership of a water right in the case of default. The Council suggests that it also paves the way for development of more advance trading instruments.

Leasing of water rights is possible in South Australia. The Central Irrigation Trust now offers one, two, three, five and 10-year leases through the Central Water Exchange, providing opportunities for the sale and leaseback of water rights and other more advanced options. As water trading becomes more widespread and markets further develop, these instruments are likely to become more widely available.

The Council is satisfied that the capital efficiency of water rights in South Australia does not impact on the efficacy of water trading arrangements.

Summary

South Australia was the first State to introduce formal trade in water entitlements and has enjoyed significant gains as a result of both interstate and intrastate trading including:

- development and employment that would not have otherwise been possible;
- transfer of water from degraded areas to more productive areas, more efficient and higher value production; and
- assistance with structural adjustment in areas that are no longer financially or economically viable.

South Australia has dominated interstate trade in particular, with more than 90 per cent of water being traded into South Australia, generally as a reflection of the higher water prices within the State.

However, with the increased water has come an increase in the salinity impacts of using that water. South Australia has, however, implemented requirements for irrigation and drainage management plans and salinity prevention obligations to manage these impacts.

Within the State, the separation by South Australia of water 'holding' and 'taking' allocations is an innovative move towards the more efficient management of water rights. By allowing people to hold a water right without the ability to use that right, banks and other financial institutions can easily recover rights in the case of default. It also allows for the rapid transfer of water rights without complicated and lengthy environmental assessments. However, these assessments are still required if the right is to be transferred to a 'taking' allocation.

In looking to the future, supplementary information provided by South Australia noted:

> *Despite significant progress, all jurisdictions have agreed that their respective trading markets are not as active as they should be and substantial quantum improvements can still be made.*

The Council's view is that important steps in achieving these improvements in South Australia include:

- improving enforcement arrangements;
- finalising water allocation plans and transfer criteria for all prescribed resources, and ensuring that these resources are being utilised at a sustainable level;
- ensuring adequate funding for the proposed registry; and
- examining arrangements that may impede trade, such as limits on the volume of water that may be traded out of a scheme, and reduction factors on water transfers to ensure that there are based on a sound public benefit or environmental objectives and that this objective is achieved in a way that minimises the impact of efficient trade.

Assessment

The Council is satisfied that South Australia has met 2001 NCP commitments in relation to water trading. The Council will continue to monitor the efficacy of trading arrangements in future assessments as necessary.

Environment and water quality

Jurisdictions must have in place integrated resource management practices, including:

- demonstrated administrative arrangements and decision making processes to ensure an integrated approach to natural resource management and integrated catchment management;
- an integrated catchment approach to water resource management including consultation with local government and the wider community in individual catchments; and
- consideration of landcare practices to protect rivers with high environmental values (clauses 6a and b, and 8b and c).

South Australia continues to implement an integrated hierarchy of plans to cover all aspects of water resource management. For each prescribed area this involves compliance with the overarching State Water Plan 2000, the relevant water allocation plan and, where the resource lies within the catchment area of a catchment management board, the relevant catchment water management plan.

Catchment water management plans are developed for areas where there is a broad range of water resource management issues. These plans describe the health and water needs of water dependent ecosystems, including programs and methods to monitor and improve the health of ecosystems. These plans can provide legal protection to environmental water needs through controls on water affecting activities such as dam or weir construction. Catchment boards are statutory based and have the ability to raise funds to implement actions that are specified in plans. These actions are complimentary to environmental water provisions such as riparian and wetland management and rehabilitation.

There are eight catchment water management boards developing catchment water management plans to cover 95 per cent of the State. For unprescribed water sources, local water management plans are encouraged for future development by local Councils in accordance with the State Water Plan.

South Australia is in the process of introducing legislation to further refine integrated natural resource management arrangements. In the interim, there are nine Integrated Natural Resource Management committees developing integrated regional strategies based on the Natural Heritage Trust regions in the State. These interim committees have been established to increase coordination and reduce duplication in natural resource management.

South Australian arrangements

Integrated resource management

The South Australian Government is currently reviewing the institutional arrangements to deliver integrated natural resource management. A draft Bill has now been prepared and was released for public consultation in mid February 2001. Submissions on the draft Bill closed on 30 March and it is anticipated that the Bill will be introduced to Parliament in the Autumn session.

The draft Bill seeks to promote and facilitate the sustainable management of the State's natural resources through the following mechanisms:

- the establishment of an Integrated Natural Resource Management Board comprising three Ministers. The board will be required to prepare a State natural resource management plan;
- establishing integrated natural resource management regions; and
- establishing integrated natural resource management groups. The Bill requires these groups to prepare natural resource management and investment strategies (consistent with the Statewide plan).

South Australia currently has nine interim integrated natural resource management committees based on the existing natural heritage trust regions in the State. Membership of these interim committees comprises stakeholder organisations, government and the community. Some committees are largely skills based and some are representative. These interim bodies are likely to form the basis for the integrated natural resource management groups to be established under the proposed legislation.

Integrated catchment management

The integrated catchment management program under the *Water Resources Act 1997* has been extended to include two additional catchment water management boards (for the arid areas and Eyre Peninsula). This brings the total number of Catchment Water Management Boards to eight.

In the six existing board areas, the development of catchment water management plans are in the final stages of completion. The Onkaparinga, the Northern Adelaide and Barossa plans have been adopted. The River Murray, Torrens and Patawalonga plans are due by the end of 2001. The South East is scheduled for completion in mid 2002. For the two new boards, catchment water management plans will be developed over the next two years, involving the local community, other natural resource management bodies and government departments.

As well as environmental water provisions, catchment water boards are also implementing complimentary actions critical to maintaining or restoring ecosystem health. This includes actions such as control of pest plants and animals, erosion control, revegetation, and structural works.

The success of the integrated catchment management program will be assessed as part of a review of the operation of the *Water Resources Act 1997* to be completed by 30 June 2002.

The catchment water management plan outlines priorities, and then determines the allocation of funds to achieving the specific goals for catchment improvement. The legislation also requires catchment boards to consider consistency with other natural resource plans such as those put out by soil conservation boards, plant and animal control board, and national parks management.

Catchment water management boards leverage their funds to attract other State and federal funding to the area of integrated catchment management. Funding for the catchment water management boards is through the catchment levy raised on water allocations and land ownership. Approved expenditure by catchment water management boards for 2000-01 is approximately $20 million with more than half of this allocated for catchment works. The remainder is largely allocated between community education programs and planning.

The Department for Water Resources in conjunction with the South Australian Water Resources Council is developing a simple report card framework as the basis for assessing implementation of catchment water management plans.

Assessment

South Australia is well advanced in the development of catchment management plans by catchment management boards in the areas surrounding Adelaide. However, implementation and planning for catchment management in areas further away from Adelaide seems to be slow.

Of the eight Catchment Management Boards (which cover 95 per cent of South Australia), two plans are in place, and three more will be in place by the end of 2001. The catchment water management plan for the South East will be in place by mid 2002, and the remaining new catchment management boards have two years to complete their respective catchment management plans. The Council will examine progress against the above timetable in the 2002 and 2003 assessments.

South Australia also proposes to review the operations of the catchment management planning process as part of the review of the *Water Resources Act 1997* in 2002 to clarify and improve existing frameworks.

The Council has reviewed the draft provisions of the Integrated Natural Resource Management Bill. The objectives of the Bill are to promote and facilitate integrated and sustainable management of the States natural resources through the implementation of regional initiatives. To meet these objectives, the Bill provides for the establishment of a Board and integrated natural resource management groups. The Council is generally satisfied that the provisions laid out in the Bill will enable South Australia to build on the integrated catchment management process currently underway.

The Council has also examined the completed Onkaparinga Water Catchment Management Plan, and the draft Northern Adelaide and Barossa catchment management plans. South Australia has developed these plans with the goal of managing water on a total catchment basis, with the primary aims of improving the quality of catchment water and protecting the watercourses from further degradation.

The goals of the Onkaparinga Water Catchment Management Board (which will be implemented by a program of works and measures outlined in the plan) are to:

- rehabilitate and manage watercourses, by implementing and promoting best practice environmental management;
- maintain and enhance the quality of surface and ground waters;
- use water sustainably and balance consumptive and environmental water use for current purposes and future needs, and reuse non-traditional water resources;
- develop an aware and committed community through an effective consultation and education program including promotion of environmental responsibility and involvement of the community in environmental issues; and
- integrate resource management through coordinated policies and effective partnerships between stakeholders.

The Council notes that for each of these goals, the key issues have been identified, current conditions and trends stated, actions proposed, and the expected outcomes over the period of the plan stated. The Council is satisfied that the Onkaparinga Water Catchment Plan is a comprehensive document that when fully implemented will make a significant step to addressing the needs of water management in the region.

The Council also examined the draft plans prepared by the Northern Adelaide and Barossa Catchment Management Board and is satisfied that the eight goals stated in the plans, together with the implementation strategies and targets, would satisfy CoAG water reform requirements by addressing the catchment related water management issues in the region. South Australia has met commitments for this assessment.

National Water Quality Management Strategy

Jurisdictions agreed to support ANZECC and ARMCANZ in developing the National Water Quality Management Strategy (NWQMS), through the adoption of market-based and regulatory measures, water quality monitoring, catchment management policies, town wastewater and sewage disposal, and community consultation and awareness.

Jurisdictions are to demonstrate a high level of political commitment and a jurisdictional response to ongoing implementation of the principles contained in the NWQMS guidelines, including on-the-ground action to achieving the policy objectives (clause 8b and d).

South Australia has released a draft Environmental Protection (Water Quality) Policy to address the implementation of the National Water Quality Management Strategy. This policy will apply to South Australia's inland (surface and ground), estuarine and marine waters and will provide a consistent framework for protecting water quality across all water bodies. The policy will protect and improve the quality of the State's water bodies, as well as encourage wastewater reuse.

The State Water Plan 2000 identifies a number of actions in relation to the environment and water quality reforms in South Australia. These include salinity action strategies, salt interception schemes, water quality plans, and well rehabilitation.

Water quality issues for South Australia relate to both salinity in the Adelaide Hills catchment area and in the Murray River, and problems with nutrients, turbidity and bacteriological quality in the reservoirs of the Mount Lofty Ranges, particularly the Onkaparinga catchment.

Salinity is a major future problem for South Australia involving saline groundwater and river salinity. The National Land and Water Resources Audit estimates that South Australia currently has 390 000 hectares affected by dryland salinity and that this may grow to 6 million hectares by 2050 (NLWRA 2001b). Groundwater may become too saline for irrigation in the Murray Basin within 10 to 20 years. The Murray-Darling Basin Commission's salinity and drainage strategy has reduced river salinity in the River Murray but it is a continuing problem. The South Australian Government is a signatory to the National Salinity and Water Quality Action Plan.

South Australian arrangements

State Water Plan 2000

The State Water Management Plan 2000 outlines the following actions in relation to the environment and water quality reforms.

- **Environmental values and protection**. During 2000-01, the Government will establish a consistent Statewide approach to the determination of environmental values and protection of water quality

across all South Australian waterbodies. This action will entail completion of an Environment Protection (Water Quality) Policy.

- **Salt interception schemes**. The South Australian Government will work with the Commonwealth Government, the Murray-Darling Basin Commission, the River Murray catchment water management board, local government and the local irrigation community to promote and complete four more salt interception schemes. These are Qualco-Sunlands (to be completed in mid 2001), Waikerie Stage Two (to be completed in the 2002-2003 financial year), Lock Four to Bookpurnong (to be completed in mid 2003) and Chowilla (expected completion between 2002-2003 and 2004-2005). With the completion of these four schemes, a significant part of the salt reaching the River Murray in South Australia will have been intercepted and redirected away from the river to evaporation basins. It is estimated that these schemes will intercept about 70 000 tonnes of salt per year when they are all operational.

- **Dryland salinity in the upper southeast**. The South Australian Government (in partnership with the Commonwealth) has invested $63 million to ameliorate the effects of dryland salinity in an area bordered by Keith to the north, Lucindale to the South, and Coorong to the West. The program comprises the construction of more than 200 kilometres of drains to be completed by mid-2002, and uses revegetation, saltland agronomy and wetland management.

- **Water quality and quantity in the Mount Lofty Ranges.** Catchment water management plans developed for the Mount Lofty Ranges must identify all potential threats to the quality and quantity of water that can be harvested and present both short and long-term strategies to address them (for example, the effect of farm dams). These plans should also identify any issues that require resolution (along with likely stakeholders) so that a prioritised work program can be developed and implemented. The Government will continue to ensure that appropriate resources are allocated to complement Natural Heritage Trust and community investments in education, regulation and enforcement for improved water quality outcomes in the Mount Lofty Ranges.

- **Watershed protection program.** The Government has endorsed a five-year $40 million implementation strategy aimed at improving and protecting water quality in the Mount Lofty Ranges Watershed, called the Watershed Protection Program. The program is to include accelerating the rate of sewering of major towns, fencing rivers and streams, undertaking more comprehensive and targeted monitoring programs, provision of resources for compliance management, undertaking education and awareness raising programs on activities that can impact on water quality.

- **Management of southern Fleurieu Peninsula**. During 2000-01, the Government will consider what action is necessary to implement catchment management policies in the southern Fleurieu Peninsula part

of the watershed that is currently not covered by a catchment water management board.

- **Well rehabilitation**. The South Australian Government recognises that remedial works in some cases are necessary due to past inappropriate drilling and well construction practices. Where there is an overall public benefit, the Government may consider supporting initiatives to rehabilitate inappropriately constructed wells in poor condition that are a legacy of past practices.

- **Wastewater reuse.** The State WasteWater Management plan notes the treatment of urban stormwater in wetlands which provide recreation and amenity value and in aquifers for later reuse. The South Australian Government has provided councils, developers and schools with technical advice, monitoring and financial assistance to investigate and build schemes that use urban stormwater runoff. SA Water's goal is to reuse 40 per cent of all metropolitan wastewater by 2001 with plans for supplementing depleted groundwater supplies and direct use for irrigation of horticultural and agricultural crops. The implementation of aquifer storage and recovery is being trialed at a number of sites.

- **Domestic wastewater systems**. All domestic wastewater systems (including septic tanks) are to be correctly installed and operated in accordance with Public and Environmental Health Act requirements and Department of Human Services (SA Health Commission) guidelines. Septic tanks are to be of a high standard of maintenance, including regular pump outs.

Implementation of the National Water Quality Management Strategy

The draft Environment Protection (Water Quality) Policy is expected to become subordinate legislation under the *Environment Protection Act 1993* and will give effect to the policies and principles of the National Water Quality Management Strategy. Public comment on the draft policy ended in March 2001. The South Australian Government is presently considering the comments received during this period and the policy is not expected to be finalised until end 2001.

The Policy will be a key regulatory instrument in South Australia for the protection of water quality in surface and groundwater. This will ensure all industries, irrespective of their scale of operation, operate under uniform water quality conditions. The policy will seek to protect and improve the quality of the State's water bodies, and to encourage better use of wastewater by waste avoidance or elimination, minimisation, reuse and recycling, waste treatment to reduce degrading impacts, and disposal.

Drinking water standards are based on the national strategy Australian Drinking Water Guidelines 1996.

Water monitoring

Following water quality incidents in 1998, a meeting of high-level stakeholders was held to discuss water catchment management strategies in South Australia. To facilitate the development of objectives and requirements for Statewide water monitoring, the State Water Monitoring Coordinating Sub-Committee was established.[15] This sub-committee has progressed water monitoring issues across the entire State with an initial focus on the Adelaide Hills and the Onkaparinga catchment for trialing various methodologies.

The sub-committee is establishing a methodology for developing Statewide monitoring programs by:

- establishing objectives for a State Water Monitoring Program;
- clarifying roles and responsibilities of agencies involved in monitoring;
- developing a Memorandum of Understanding between agencies, to be signed off at Chief Executive level;
- establishing a data base and recording monitoring that is already occurring in the catchment areas of the Onkaparinga Catchment Water Management Board; and
- developing a monitoring program for the Onkaparinga Catchment Water Management Board catchment area.

In October 2000, the Minister for Environment and Heritage released a report entitled 'the State of the Health of the Mount Lofty Ranges Catchment' (EPA 2000a). The South Australian Government subsequently established the Mount Lofty Ranges Watershed Protection Office to target water quality issues, coordinate appropriate water quality monitoring and catchment management policies, and develop community consultation and awareness.

River management plans

South Australian agencies have supported the development of river management plans for 11 catchments. These catchments are Wakefield, Broughton, Light, Innis, Marne, Myponga, North Para, Onkaparinga, South Para, Tod, and Torrens Rivers. River management plans primarily address issues of riparian and floodplain management, with water resources

[15] Membership of the sub-committee comprises representatives from the Department of Water Resources, Department of Environment and Heritage — Environment Protection Agency, SA Water Corporation, Department of Primary Industries and Resources, Department of Human Services, Department of Transport, Urban Planning and The Arts — Planning SA, Department for Administrative and Information Services — Forestry SA, Catchment Water Management Board, and Local Government.

management considered when it impacts on the health of riparian, floodplain and aquatic ecosystems. Plans have had hydrological input in relation to geomorphic assessments. The plans do not implement flow regimes or allocations.

Nine of the plans have been completed and are in various stages of implementation. Plans for the Light and Tod will be completed during 2001. All plans are being developed by the Department for Environment and Heritage, with support from the Department for Water Resources, Primary Industries and Resources, catchment water management boards, soil conservation boards, animal & plant control boards and local government.

Plans for the Wakefield, Broughton and Light Rivers have additionally had scientific assessments of environmental water requirements. The Wakefield and Broughton plans have aided the development of the Clare Valley water allocation plan.

River management plans are not statutory based. Rather, the plans have been developed with comprehensive community input for actions to protect and/or rehabilitate rivers. Actions are focussed on erosion control, riparian revegetation, water quality improvement and biodiversity conservation.

Salinity

The South Australian 2001 NCP annual report notes the release of a Directions for Managing Salinity in South Australia statement in August 2000. This is an overarching document to the specific draft State salinity strategies. The statement aims to provide public education on the issue of salinity, and engender public support on appropriate action. It provides broad directions for salinity management in such areas as land management practices, education and awareness, regulation and compliance, and developing new opportunities including use of saline resources.

Other salinity statements include the River Murray Draft Salinity Strategy and the Dryland Salinity Strategy. The draft River Murray Strategy was released for two months of public consultation with comments sought by 31 October 2000. The draft strategy outlines the causes of salinity and briefly describes the economic, social and environmental impact of salinity before identifying key issues, key policy proposals and proposed actions.

National Land and Water Resource Audit

The National Land and Water Resources Audit reported on surface water quality against the standards contained in the 1992 ANZECC *Australian Water Quality Guidelines for Fresh and Marine Waters* (see Table 10).

Table 10: Exceedance of water quality guidelines for South Australia

	Number of basins assessed	*Major Exceedances*	*Significant Exceedances*
Nutrient: total nitrogen	5	2	3
Nutrient: total phosphorous	4	3	1
Salinity: electrical conductivity	4	1	2
Turbidity	3	2	1
PH	1	0	0

Source: NLWRA (2001b).

The National Land and Water Resources Audit found that only a limited number of South Australian river basins have sufficient monitoring coverage to support basin water quality exceedance and trend assessments.

Major and significant salinity exceedances at a basin scale were recorded for the Myponga, Fleurieu Peninsula and Willochra Creek Basins. However, high levels of salinity were recorded more generally for monitoring stations across all basins indicating the widespread nature of salinity as a water quality issue in South Australia. The audit found high levels of turbidity for a number of basins and increasing levels for the Mallee and Lower Murray basins.

Use of stormwater and wastewater

The Torrens and Patawalonga catchment water management boards are addressing major stormwater pollution problems through community-based management plans. The works and measures contained in the plans are funded through a catchment environment levy.

South Australia is progressing a number of key initiatives that address the sustainable use of urban water, including stormwater. The Bolivar-Virginia pipeline project will result in the reuse by irrigation of up to 30 000 megalitres of sewage effluent (or approximately 35 per cent of Adelaide's total effluent) from the Bolivar Wastewater Treatment Plant. With surface and/or aquifer storage and recovery, the amount reused could increase to 48 000 megalitres (or approximately 45 per cent of Adelaide's total effluent).

The Christies Beach Wastewater Treatment Plant provides treated effluent for irrigation in the Willunga Basin. The scheme is privately funded and constructed, operated and maintained at no cost to the Government.

Water Services Association of Australia Facts

WSAA Facts 2000 reported on water quality compliance for 1999-2000 for SA Water Corporation, and noted:

- 97.8 per cent compliance with bacteriology standards, and 100 per cent compliance with physical-chemical (turbidity/colour/ph) as set out in the 1996 Australian Drinking Water Guidelines; and

- with regard to wastewater treatment and discharge standards set in licences, SA Water Corporation is operating with 100 per cent compliance. (WSAA 2000)

Assessment

The Council has examined the 1999 and 2000 Annual Reports of the State Water Monitoring Coordinating Sub-committee, which outlines the achievements of the previous year and describes forward work plans. These reports show that South Australia has an ongoing commitment to a coordinated approach to water quality management, and implementing the National Water Quality Management Strategy. The sub-committee is continuing to review, address and improve the monitoring activities undertaken in the State. Further work to develop an integrated and efficient water monitoring program for the State is underway.

The Council is concerned at the slow pace of finalisation of the draft Environmental Protection (Water Quality) Policy to implement the National Water Quality Management Strategy. South Australia has advised that the Environment Protection Agency is following a statutory process in finalising the policy. While public consultation closed in March 2001, there is to be a two month period of agency consultation that is yet to commence. This is to review the policy after any amendments have been made as a result of the comments received from the first round of consultation. This means the policy will not be completed until October or November 2001 before being sent to government for final endorsement. The Council notes that the first of the national strategy guidelines were originally finalised in 1992.

The Council has examined a report by the Minister for Environment and Heritage entitled the 'State of the Health of the Mount Lofty Ranges Catchment' (EPA, 2000a) and notes actions that have been implemented and those that are proposed to improve long term water quality of the Mount Lofty Ranges.

The Council is satisfied that South Australia meets commitments for this assessment. The Council will continue to monitor developments in this area. The Council would expect the draft Environment (Water Quality) Policy to be implemented for the June 2002 assessment.

Public consultation and education

Jurisdictions must have consulted on the significant CoAG reforms (especially water pricing and cost recovery for urban and rural services, water allocations and trade in water entitlements). Education programs related to the benefits of reform should be developed (clauses 7a to e).

South Australia continues to engage and actively consult the community through significant programs and communication strategies accompanying all major reform initiatives to ensure the full benefits of the reforms are understood and achieved.

South Australian arrangements

The State Water Plan 2000

The South Australian 2000 NCP annual report states that extensive communication and education was undertaken in the lead up to the release of the State Water Plan in September 2000. The plan was widely distributed to government agencies, catchment water management boards, planning committees, local councils and other relevant authorities and individuals in South Australia and interstate. Compact disc versions of the plan are currently being distributed to all secondary schools in the State. The Plan has also been made publicly available through the Department of Water Resources website.

The plan identifies the following actions in relation to public consultation and education in South Australia.

- **Water use behaviour**. The South Australian Government will make information available to all sectors of the community about the choices available and the costs associated with reducing water consumption (and where possible, reusing water) so that people and organisations can make informed decisions about their water use behaviour.

- **Community consultation in water resource management plans**. The Government will continue to ensure effective community consultation takes place in the development of water resource management plans and that the relevant information will be made available for informed input.

- **Partnerships**. The Government will continue to strengthen partnerships with relevant interests groups when monitoring and evaluating South Australia's water resources. Initiatives of this type include Waterwatch, and working with industry groups to refine land use mapping and estimations of water use.

- **Information sharing**. The Government is committed to making water resource data more accessible to organisations responsible for water resource management and the broader community through:
  - improving water data and information management systems;
  - providing Internet access to water data and information;
  - developing a natural resource information system;
  - providing assessment reports on key issues in specific areas; and
  - encouraging public involvement in monitoring programs such as Waterwatch and through the catchment and water allocation planning processes.

Other programs

There is a range of important initiatives undertaken by State Government agencies and community-based bodies, including catchment water management boards, to raise community awareness on sustainable water resources management and use.

The devolution of a range of water management responsibilities to catchment water management boards has significantly enhanced the level of community awareness and education in relation to water and wastewater as a valuable resource. Each of the eight Catchment Water Management Boards allocates a significant proportion of their budget to community education and awareness.

South Australia continues to participate in national initiatives such as Waterwatch and National Water Week. National Water Week has become a major event in South Australia and involves hundreds of events and activities held throughout the State including environmental walks, media water saving campaigns, newspaper educational features, and school activities.

Waterwatch has been increased to 13 regional programs to reach more community groups and students in South Australia's key catchments. Through increased resources and the formation of strong partnerships with catchment water management boards, participation in the water quality monitoring program and educational activities has doubled to more than 300 community and school groups, or 6000 individuals across the State.

The formation of the Department for Water Resources has led to a targeted focus on water related issues in the media, promoting an understanding of the need for water reform, and water conservation. For example, the South Australian government is increasing public awareness of water reform and innovative water projects through the development of options for stormwater and wastewater treatment and reuse. A high public profile has been given to a number of projects including the Mawson Lakes residential development (involving wetland water treatment, Aquifer Storage and Recovery projects,

and water reuse), the Parafield Airport, and Morphettville racecourse wetland.

South Australia continues to develop educational strategies such as 'Watercare - A Curriculum Resource for Schools' in response to community requests for information and educational strategies to address water resources management issues. This is a three stage project being undertaken by the Department for Environment, Heritage and Aboriginal Affairs and the Department of Education, Training and Employment to develop curriculum material. Watercare III provides South Australian case studies of best practice management of water resources in the State. It includes information on wetlands, groundwater resources, aquifer storage and recovery, stormwater, wastewater and sewage effluent, irrigation, water supply infrastructure, and water quality and quantity.

WaterWise is a community-based project funded through the National Heritage Trust and Murray-Darling Association working with industry to develop best practice water conservation demonstration sites.

A Water Conservation Partnership Project has been established that links local government and the community with State government departments in addressing the issue of water conservation for the benefit of the River Murray. The project will incorporate the production of educational material to be used with councils and residents. An Integrated Schools Package has been produced by the River Murray Urban Users Group which has also worked with teachers on educational material specific to the Murray—Darling Basin.

The South Australian 2001 NCP annual report provides a range of government and private industry water related web sites aimed at providing educational information and resources on water initiatives.

SA Water's Environmental Improvement Program is an example of a public education program to provide information on the substantial initiatives and costs being incurred to manage the environmental impacts of discharges from the four major metropolitan wastewater treatment plants. Sewerage charges incorporate a levy for environmental impacts. Public education enable the public to recognise that, however remote, there is a link between the level of waste they discharge into the sewerage system and the costs they incur. There are also specific benefits of reduced environmental impacts including reduced discharges to the marine environment, reuse of wastewater and improved odour control. Public education has been facilitated by SA Water's public relations unit through advertising, display material, website information and the distribution of dedicated publications.

SA Water has undertaken community consultation programs in relation to the Environmental Improvement Programs for the wastewater treatment plants at Port Adelaide, Port Pirie, Whyalla, Port Augusta and Victor Harbor. There are significant water education programs undertaken by SA Water.

Assessment

In the second tranche NCP assessment, the Council noted the recommendation made by the South Australian Competition Commissioner on the need for greater public consultation on SA Water prices as a 2001 tranche assessment issue. As discussed in the section on institutional reform, the Council continues to have concerns with the level of transparency in water pricing and this will be examined further in future NCP assessments.

The Council also noted in the second tranche assessment the need for devolution of water resource management to a greater level of consultation and participation by the community. The Council congratulates South Australia on the level of public consultation it has subsequently embraced in the area of consultation on natural resource management issues.

The Council has reviewed the information provided by South Australia and believes the development of the water allocation plans and catchment water management plans have been subject to considerable consultation. The Council also notes the scope for local government input into the future development of local water management plans. South Australia continues to produce a range of materials on the need and benefits of water reform for schools and the wider community.

It is the Council's view that South Australia has met its 2001 NCP commitments in relation to education and consultation.

Attachment 1: Summary of licence fees 1999-2000

Type of fee	*Charge*
Application for a permit	$31.80
Provision of copies of various documents such as water allocation plan, CWMPs, State Water Plan	$1/page but not exceeding $30
Application for new well driller's licence	$146
Application for renewal of well driller's licence	$72
Application for variation of well driller's licence	$111
Application for water licence	
- where licence has expired	$31.80
- in any other case	$130
Application to transfer water licence	$214
Application to vary licence	$214
Additional fee for technical assessment of the effect of granting a variation or transfer of licence	$107
Application for notation on the register of water licences	$5.15
Fee for providing information required under the Land and Business (Sale and Conveyancing)Act 1994	$15
Rent for meter for a period of 21 months or less ending 30 June	
Size of meter:	
less than 50mm	$119
50mm to 100mm	$173
150mm	$256
200mm to 380mm	$292
407mm to 610mm	$352
Fee for reading meter at request of licensee or for testing meter under section 126(4) of the Water Resources Act 1997	Estimated cost quoted by Minister

Source: *Water Resources Act 1997*, regulation number 106 (1999)

Appendix A: Third tranche assessment framework

Note: originally released in February 2001

Water reform highlights the multifaceted nature of NCP. The reform package put in place by CoAG in 1994 encompasses urban and rural water and wastewater industries and includes economic, environmental and social objectives. The reform program is aimed at improving the efficiency and effectiveness of water service providers and instituting water management planning such that the effect of all water use (by agriculture, industry, households and the environment) is taken into account.

Significant second tranche reform matters included: urban water pricing; approaches to determining the economic viability and ecological sustainability of new investment proposals; timetables for providing environmental allocations in stressed river systems; and frameworks to allow for appropriate institutional structures and the allocation and trading of water.

The third tranche program extends these commitments. It focuses on the 'on-the-ground' outcomes of the reform process in such areas as rural water pricing and cost recovery, environmental allocations or provisions for the environment, water quality issues, trading arrangements and further institutional reforms.

The Council's second tranche assessment for water reform focused on the establishment of the legislative systems and structures to deliver the CoAG water reforms. A key focus of the third tranche and future assessments will be seeking information from jurisdictions that the reforms, structures and systems are generating real benefits. The 1994 CoAG strategic water reform framework (the CoAG Framework) and related documents subsequently endorsed by CoAG provide the basis for the Council's assessments of water reform progress. The CoAG documents provide generally very broad descriptions of the water reform obligations. Because of this, the third tranche framework developed by the Council provides more detailed explanation and interpretation of the water reform obligations. The framework does not redefine the commitments determined by CoAG, but aims to:

- provide a clear, transparent basis for assessment particularly in relation to matters not considered in previous assessments;
- identify the type of information that jurisdictions should provide to demonstrate compliance; and

- provide a basis for early identification and bilateral discussion of areas where achieving reform outcomes is proving difficult.

The Council's interpretation is based on the experience of earlier assessments, discussions with States and Territories and other stakeholders, and other work by the Council and other relevant organisations.

Jurisdictions have also provided input into the material presented in this chapter. The comments made by governments ranged from the need to be more specific in some areas on how the NCC might assess an item, to the view that the approach in areas is too prescriptive. The Council has sought to accommodate specific comments wherever possible.

Jurisdiction-specific matters arising from the CoAG Strategic Framework

The Council recognises that the reforms may be applied in different ways depending upon the specific circumstances faced by jurisdictions. For example, effective resource management is important for all jurisdictions but the manner in which it is applied may vary according to a range of factors including the level and number of stressed river systems within the jurisdiction. Also, some reforms may not be relevant for some jurisdictions. For example, the ACT does not have a rural water sector and hence these reforms are not required.

In the same way it conducted its second tranche assessments, in the lead up to the third tranche water assessment the Council will hold bilateral discussions on jurisdiction-specific matters and any differences in interpretations relevant to the implementation of the 1994 Strategic Framework. Any remaining concerns can be dealt with through bilateral discussions.

Further NCC Background Papers on Aspects of CoAG Water Reforms

In addition to the guidance on each reform commitment provided in this framework, the Council is separately releasing several additional background papers providing more detailed discussion on a number of issues covered by this framework.

These papers provide background information on the rationale underlying some of the Council's interpretations of the CoAG water reform commitments in a number of *hot spot* areas. However, these papers are provided as background material for reference by jurisdictions and interested parties. They do not form part of this assessment framework.

The Papers have been provided to the Commonwealth and all States and Territories and will be available shortly after the release of the third tranche assessment framework. Copies of the papers will be available from the water section of the Council's website at www.ncc.gov.au.

The papers are listed in Box A.1.

Box A.1: Background information papers on water reform commitments

- **Rural water pricing**. This paper covers full cost recovery in the rural sector including CSOs and positive rates of return.
- **New investment in rural water infrastructure**. This paper discusses a methodology to assess the economic viability and ecological sustainability of new investments in this area.
- **Institutional reform issues in the water industry**. This paper discusses why regulation is important and examines the potential for conflicts of interest between regulation and service provision and arrangements to deal with these.
- **Environmental requirements of the CoAG Water Reforms** (paper prepared with the assistance of Environment Australia). This paper outlines the national agreements on the environment that may be useful as a guide in reporting progress against the environmental requirements of the water framework.
- **Implementing the National Water Quality Management Strategy** (paper prepared by Environment Australia and the Department of Agriculture Fisheries and Forestry Australia in consultation with State and Territory government agencies). The Commonwealth, after consultation with States and Territories, has proposed that implementation of the guidelines should be assessed through a two yearly review process. This paper provides a list of the component modules of the National Water Quality Management Strategy (NWQMS) guidelines and their current status. The Council will be looking to jurisdictions to show how the guideline principles have been adopted in the third tranche and subsequent assessments.
- **Defining water property rights.** This paper will discuss the specification of water property rights so as to promote efficient and sustainable investment and trade.
- **Water reform and legislation review.** This paper will outline the status of legislation reviews of relevant water legislation for each jurisdiction based on a stocktake report conducted by Marsden Jacob consultants.

The 1994 CoAG Strategic Framework

Reform commitment: pricing and cost recovery

In relation to pricing:

3(a) in general –

(i) to the adoption of pricing regimes based on the principles of consumption-based pricing, full-cost recovery and desirably the removal of cross-subsides which are not consistent with efficient and effective service, use and provision. Where cross-subsides continue to exist, they be made transparent,

Queensland, South Australia and Tasmania endorsed these pricing principles but have concerns on the detail of the recommendations;

(ii) that where service deliverers are required to provide water services to classes of customer at less than full cost, the cost of this be fully disclosed and ideally be paid to the service deliverer as a community service obligation (CSO);

3(b) urban water services –

(i) to the adoption by no later than 1998 of charging arrangements for water services comprising an access or connection component together with an additional component or components to reflect usage where this is cost-effective;

(ii) that in order to assist jurisdictions to adopt the aforementioned pricing arrangements, an expert group, on which all jurisdictions are to be represented, report to CoAG at its first meeting in 1995 on asset valuation methods and cost-recovery definitions; and

(iii) that supplying organisations, where they are publicly owned, aiming to earn a real rate of return on the written-down replacement cost of their assets, commensurate with the equity arrangements of their public ownership;

3(c) metropolitan bulk-water suppliers –

(i) to charging on a volumetric basis to recover all costs and earn a positive real rate of return on the written-down replacement cost of their assets;

3(d) rural water supply –

(i) that where charges do not currently fully cover the costs of supplying water to users, agree that charges and costs be progressively reviewed so that no later than 2001 they comply with the principle of full-cost recovery with any subsidies made transparent consistent with 3(a)(ii) above;

(ii) to achieve positive real rates of return on the written-down replacement costs of assets in rural water supply by 2001, wherever practicable;

(iii) that future investment in new schemes or extensions to existing schemes be undertaken only after appraisal indicates it is economically viable and ecologically sustainable;

(iv) where trading in water could occur across State borders, that pricing and asset valuation arrangements be consistent;

(v) where it is not currently the case, to the setting aside of funds for future asset refurbishment and/or upgrading of government-supplied water infrastructure; and

(vi) in the case of the Murray-Darling Basin Commission, to the Murray-Darling Basin Ministerial Council putting in place arrangements so that, out of charges for water, funds for the future maintenance, refurbishment and/or upgrading of the headworks and other structures under the Commission's control be provided;

3(e) groundwater –

(i) that management arrangements relating to groundwater be considered by Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) by early 1995 and advice from such consideration be provided to individual jurisdictions and the report be provided to CoAG;

NCC interpretation and benchmarks for third tranche

Consumption-based pricing (clauses 3(a), 3(b) and 3(c))

Governments have committed to the principle of consumption-based pricing. For urban water providers using surface or groundwater, two-part tariffs (comprising a fixed access component and a volumetric cost component) are to be introduced where cost effective.

Most governments have made progress against commitments for urban water providers to implement two-part tariffs where cost effective. Where the deadline was not achieved at the time of the second tranche assessment, the

Council in its third tranche assessment will look for substantial subsequent progress.

The third tranche assessment will look for assessments of the cost effectiveness of two-part tariffs, to be completed for service providers with greater than 1000 connections. Jurisdictions are asked to provide copies of any reviews which show that implementation is not cost effective, particularly where this involves large service providers.

Where these assessments show two-part tariffs to be cost effective, the Council is looking for jurisdictions to commit to timely implementation. A strong net public benefit justification will need to be provided where implementation is to be phased beyond 2001.

Metropolitan bulk water suppliers should establish internal and external charges that are volumetrically based or are comprised of a two-part tariff with an emphasis on the volumetric component. Metropolitan wastewater charges should reflect the level of services received (volume and pollutant load) where practicable (for example, through effective trade waste charges). Similarly, the Council supports rural water prices including an appropriate volumetric component wherever practicable.

Ideally, all free water allowances should be removed, as these can lead to cross-subsidisation, inhibit incentives for economical water use and undermine the principle of consumption-based pricing. In any instances where low level free water allowances are retained or are to be phased out over time, jurisdictions should provide evidence that a significant proportion of customers and water supplied still face a strong volumetric signal.

Charges based on property values do not necessarily reflect cost of services provided to different customer classes. Where property values are used the Council will look to ensure that they do not undermine the principle of consumption-based pricing.

Full cost recovery – in general (clauses 3(a)(i), 3(b)(iii) and 3(c)(i) 3(d)(i), 3(d)(ii), 3(d)(v) and 3(d)(vi))

Compliance with the CoAG pricing guidelines developed through the Standing Committee on Agriculture and Resource Management (SCARM) Taskforce on CoAG Water Reform and endorsed by ARMCANZ and Senior Officials (see Box A.2) will form the basis of the Council's assessment of progress against CoAG commitments in this area.

Jurisdictions are asked to provide information on the degree to which each aspect of the CoAG guidelines has been met. This should involve, among other things, information on methodologies for assets valuation and provision for asset consumption, as well as information on the treatment of taxes and tax-equivalent regimes (TERs), externalities, dividends and return on capital. Information should be provided on water and wastewater services separately.

Box A.2: Guidelines for the application of Section 3 of the Strategic Framework and Related Recommendations in Section 12 of the Expert Group

1. Prices will be set by the nominated jurisdictional regulators (or equivalent) who, in examining full cost recovery as an input to price determinations, should have regard to the principles set out below.

2. The deprival value methodology should be used for asset valuation unless a specific circumstance justifies another method.

3. An annuity approach should be used to determine the medium to long term cash requirements for asset replacement/refurbishment where it is desired that the service delivery capacity be maintained.

4. To avoid monopoly rents, a water business should not recover more than the operational, maintenance and administrative costs, externalities, taxes or TERs [tax equivalent regime], provision for the cost of asset consumption and cost of capital, the latter being calculated using a WACC [weighted average cost of capital].

5. To be viable, a water business should recover, at least, the operational, maintenance and administrative costs, externalities, taxes or TERs (not including income tax), the interest cost on debt, dividends (if any) and make provision for future asset refurbishment/replacement (as noted in (3) above). Dividends should be set at a level that reflects commercial realities and stimulates a competitive market outcome.

6. In applying (4) and (5) above, economic regulators (or equivalent) should determine the level of revenue for a water business based on efficient resource pricing and business costs. Specific circumstances may justify transition arrangements to that level.

7. In determining prices, transparency is required in the treatment of community service obligations, contributed assets, the opening value of assets, externalities including resource management costs, and tax equivalent regimes.

Source: NCC (1998)

Jurisdictions will need to demonstrate that urban and non-metropolitan urban (NMU) water and wastewater providers are recovering costs consistent with the agreed guidelines and CoAG commitments. For vertically integrated providers, processes should be in place to establish the contribution to total cost of major functional areas such as headworks, bulk water, reticulation and retail services.

In regard to rural water pricing[1], consistent with the outcomes of the 14 January 1999 tripartite meeting,[2] the Council will assess jurisdictions as having complied with the pricing requirements where jurisdictions:

[1] The Council has defined this to include all water supply services other than those supplied to urban or non-major customers.

- have achieved full cost recovery;
- have established a price path to achieve full cost recovery beyond 2001 with transitional CSOs made transparent; or
- for schemes where full cost recovery is unlikely to be achieved in the long term, have made the CSO required to support the scheme transparent; and
- have made cross-subsidies transparent.

In applying the outcomes of the tripartite meeting to rural water providers, the Council will look for a substantial proportion of schemes to be recovering at least the lower band of the agreed guidelines. Consistent with CoAG commitments, the Council will look for schemes to, wherever practicable, be earning a positive rate of return on assets.

As with its assessment of urban water providers, the Council will look for rural service providers to establish an annuity for upgrading or refurbishing water supply infrastructure but will also accept other approaches where consistent with the objectives of this aspect of the CoAG Framework.

The Council will look for a sound public benefit justification for those schemes that are unlikely to attain the lower bound even in the long run. The Council will also look for the number and materiality of these schemes to be small.

The CoAG water pricing principles call for regulators to take into account externalities in the setting of prices. The Council would consider a proxy for environmental externalities as the costs to water agencies of mitigating environmental problems. While the approach is not ideal, it is the best the Council can do at this stage of the reform process given the embryonic nature of mechanisms for addressing externalities including problems in trying to identify, quantify and attribute externality costs into individual prices.[3]

Cross-subsidies (clause 3(a)(i))

Clause 3(a)(i) of the CoAG Framework states that cross-subsidies should be transparently reported and ideally removed where they are not consistent

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2 In January 1999, a tripartite meeting was held between representatives from the NCC, the High Level Steering Group on Water Reform (augmented with representatives from ARMCANZ and ANZECC) and the Committee on Regulatory Reform to discuss concerns surrounding the implementation of the CoAG water reform framework. The recommendations arising from the meeting were subsequently endorsed by CoAG.

3 The reality is there will be environmental costs that will not be reflected in pricing. Of course, another way of approaching the problem is for governments to establish some form of property rights over the environment and establish environmental allocations or contingencies.

with efficient service provision and use. In response to the 14 January 1999 tripartite meeting, governments subsequently agreed that:

> *In making its assessment the NCC shall not seek to make its own assessment of the adequacy of the justification of any individual CSOs or cross-subsidies but jurisdictions will provide explanations of the intent of the CSOs and cross-subsidies and the NCC will examine how in totality they do not undermine the overall policy objectives of the strategic framework for the efficient and sustainable reform of the Australian water industry.*

The Council's third tranche assessment will look for governments to demonstrate that they have identified and transparently reported the objectives and size of all cross-subsidies. Furthermore, where a cross-subsidy has efficiency or effectiveness implications that are sufficient to undermine the overall policy objectives of the CoAG Framework, the Council will look for jurisdictions to justify the rationale for the retention of the cross-subsidy. This information should include the objectives of the cross-subsidy and discussion of why these objectives could not be achieved more effectively by another means. The Council will also consider the mechanisms in place to ensure ongoing effective treatment of cross-subsides in the future (for example, guidelines, independent regulation, future reviews).

An economic measure which looks at cross-subsidies outside of a Baumol band (which sets prices between incremental and stand alone cost), is consistent with the CoAG objective of achieving economically efficient water usage and investment outcomes. Thus, CoAG commitments do not preclude differential pricing within the bounds of incremental and standalone cost. However, where prices are below incremental cost, any shortfall in total revenue recovered through prices above standalone cost should be transparently reported. Further, where inconsistent with efficient and effective service provision and use, cross-subsidies should ideally be removed or replaced with a transparent CSO.

Community Service Obligations (clause 3(a)(ii))

Where service deliverers are required to provide water and wastewater services to classes of customers at less than full cost, this must be fully disclosed and, ideally, be paid to the service deliverer as a CSO.

As noted above, as a result of the January 1999 tripartite meeting, governments agreed that the Council would not make its own assessment of the appropriateness of any individual CSOs. However, it was also agreed that the Council would review information on CSOs provided by governments in totality to ensure that these CSOs do not undermine the objectives of the agreed water reform framework.

Thus, the third tranche assessment will look for governments to provide information on the size and objectives of CSOs provided by State and local government water businesses. In considering this information the Council

will look for State and local government CSOs to be provided via an effective framework for identifying, costing, funding, delivering and reporting CSOs. The Council will also look for evidence that the application of this framework is leading to CSOs that are clearly defined, have an explicit public benefit objective, are transparently reported and are consistent with the aims of CoAG pricing reforms.

New rural schemes (clause 3(d)(iii))

This provision commits jurisdictions to conducting robust, independent appraisal processes to determine *economic viability* and *ecological sustainability* prior to investing in new rural schemes, existing schemes and dam construction. Jurisdictions are to assess the impact on the environment of river systems before harvesting water. Legislative provisions, institutional arrangements as well as policies and procedures must be in place to ensure the economic viability and ecological sustainability of new investments in rural schemes prior to development.

In undertaking its third tranche assessment the Council will review developments since the second tranche assessment. This will include:

- revisiting matters raised for further consideration;
- review any changes to arrangements since July 1999; and
- ensuring that the viability and sustainability of any new projects has been established prior to their construction.

In considering the above matters the Council will look for assessment processes to provide for appropriate independence and public consultation and scrutiny. Arrangements should also be flexible enough to match the depth of analysis with the size and significance of the project. For large developments in particular, assessments should be based on the best information available with any assumptions and limitations clearly stated.

For assessments of economic viability the Council will look for all relevant economic, social and environmental costs and benefits to be factored into the analysis.[4] For large developments the Council suggests that a robust cost benefit analysis is an effective way of meeting CoAG commitments.

For assessments of ecological sustainability the Council is interested in information on the nature of the assessment and decision making processes as well as mechanisms to monitor the impacts of the development and compliance with environmental standards.

[4] Viability assessments should also discount cash flows using an appropriate rate such as a project specific weighted average cost of capital.

Reform commitment: institutional reform

In relation to institutional reform:

> 6(c) to the principle that, as far as possible, the roles of water resource management, standard setting and regulatory enforcement and service provision be separated institutionally;
>
> (d) that this occur, where appropriate, as soon as practicable, but certainly no later than 1998;
>
> (e) the need for water services to be delivered as efficiently as possible and that ARMCANZ, in conjunction with the Steering Committee on National Performance Monitoring of Government Trading Enterprises, further develop its comparisons of inter-agency performance, with service providers seeking to achieve international best practice;
>
> (f) that the arrangements in respect of service delivery organisations in metropolitan areas in particular should have a commercial focus, and whether achieved by contracting out, corporatised entities or privatised bodies this be a matter for each jurisdiction to determine in the light of its own circumstances; and
>
> (g) to the principle that constituents be given a greater degree of responsibility in the management of irrigation areas, for example, through operational responsibility being devolved to local bodies, subject to appropriate regulatory frameworks being established;

NCC interpretation and benchmarks for third tranche

Institutional role separation (clause 6(c), 6(d))

As far as possible, the roles of water resource management, standard setting and regulatory enforcement and service provision should be separated institutionally. The Council will look for jurisdictions, at a minimum, to separate service provision from regulation, water resource management and standard setting. Jurisdictions will need to demonstrate adequate separation of roles to minimise conflicts of interest.

The January 1999 tripartite meeting found that, while separate Ministers would be an acceptable form of separation, it is not the only acceptable form to demonstrate adequate separation of service provision from other roles to minimise conflicts of interest. If the regulator and service provider are responsible to the same Minister, the Council would require information about how the resulting potential conflict of interest has been effectively

addressed. The CPA gives implicit support to the desirability of independent regulators in its clause 2 provisions concerning independent prices oversight.

Performance monitoring and best practice (clause 6(e))

Jurisdictions have established national processes for inter-agency comparisons and benchmarking. Benchmarking systems have recently been put in place for the NMU and rural sectors while the Water Services Association of Australia reports annually on progress with major urban providers.

The Council views active participation in these initiatives as demonstrating compliance with this aspect of the reform framework. The Council recognises the first reports for the NMU and rural sectors are likely to be a rough cut in the initial years.

Commercial focus (clause 6(f))

Metropolitan service providers must have a commercial focus, whether achieved by contracting out, corporatisation, privatisation, etc, to maximise the efficiency of service delivery. The Council will look for appropriate structural and administrative responses to the CPA obligations, covering legislation review, competitive neutrality and structural reform.

Irrigation scheme management (clause 6(g))

Jurisdictions endorsed the principle that constituents be given a greater degree of responsibility for the management of irrigation areas citing, as an example, the potential devolution of operational responsibility subject to the establishment of an appropriate regulatory framework.

In conducting the third tranche assessment, the Council will look for all impediments to devolution to have been removed and local management arrangements identified in the second tranche assessment to have been implemented. The Council will also look for decisions to be made in regard to whether devolution of irrigation scheme management takes place and, if so, advice on when this will occur. Where reform has been undertaken, evidence should be provided demonstrating that an appropriate regulatory framework has been put in place.

Reform commitment: allocation and trading

In relation to water allocations or entitlements:

4(a) the State government members of the Council, would implement comprehensive systems of water allocations or entitlements backed by separation of water property rights from land title and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality;

(b) where they have not already done so, States, would give priority to formally determining allocations or entitlements to water, including allocations for the environment as a legitimate user of water;

(c) in allocating water to the environment, member governments would have regard to the work undertaken by ARMCANZ and Australian and New Zealand Environment and Conservation Council (ANZECC) in this area;

(d) that the environmental requirements, wherever possible, will be determined on the best scientific information available and have regard to the inter-temporal and inter-spatial water needs required to maintain the health and viability of river systems and groundwater basins. In cases where river systems have been over-allocated, or are deemed to be stressed, arrangements will be instituted and substantial progress made by 1998 to provide a better balance in water resource use including appropriate allocations to the environment in order to enhance/restore the health river systems;

(e) in undertaking this work, jurisdictions would consider establishing environmental contingency allocations which provide for a review of the allocations five years after they have been determined; and

(f) where significant future irrigation activity or dam construction is contemplated, appropriate assessments would be undertaken to, interalia, allow natural resource managers to satisfy themselves that the environmental requirements of the river systems would be adequately met before any harvesting of the water resource occurs;

In relation to trading in water allocation or entitlements:

5(a) that water be used to maximise its contribution to national income and welfare, within the social, physical and ecological constraints of catchments;

(b) where it is not already the case, that trading arrangements in water allocations or entitlements be instituted once the entitlement arrangements have been settled. This should occur no later than 1998;

(c) where cross-border trading is possible, that the trading arrangements be consistent and facilitate cross-border sales where this is socially, physically and ecologically sustainable; and

(d) that individual jurisdictions would develop, where they do not already exist, the necessary institutional arrangements, from a natural resource management perspective, to facilitate trade in water, with the provision that in the Murray-Darling Basin the Murray-Darling Basin Commission be satisfied as to the sustainability of transactions;

NCC interpretation and benchmarks for third tranche

Water allocation (clause 4(a))

Governments have agreed to establish comprehensive systems of water entitlements backed by separation of water property rights from land title and clear specification of entitlements in terms of ownership, volume, reliability, transferability and, if appropriate, quality.

The Tripartite meeting considered 'comprehensive' required:

> *…A 'comprehensive system' of establishing water allocations to be put in place which recognises both consumptive and environmental needs. The system is to be applicable to both surface and ground water. However, applications to individual water sources will be determined on a priority needs basis (as determined by an agreed jurisdiction-specific implementation program.)*

The legislative and institutional framework to enable the determination of water entitlements and trading of those entitlements should be in place. The framework should also provide a better balance in water resource use including appropriate allocations to the environment as a legitimate user of water in order to enhance/restore river health. The Council will also look for appropriate treatment of overland flows.

Water Property Rights

The Council will look for evidence that jurisdictions have in place the necessary legislation, policy, administrative systems and institutional arrangements to implement comprehensive systems of entitlements backed by separation of property rights from land title and clear specification. These arrangements should set:

- the rights and responsibilities of the Crown, users and the environment;
- provide for consultation, community involvement and public education;
- provide a methodology for determining and reviewing a sustainable balance between competing uses (including the environment); and
- deal with intra and interstate consistency where necessary.

The Council is aware there have been some recent concerns by stakeholders concerning what constitutes a water property right for the purposes of the water framework. The Council notes the work done by ARMCANZ in the 1995 paper 'Water Allocations and Entitlements: A National Framework for the Implementation of Property Rights in Water', and by the High Level Steering Group on Water (HLSGW)[5] in the 2000 paper 'National Approaches to Water Trading' which has recently been released for public consultation.

All jurisdictions have passed legislation to define water rights more clearly, separate water entitlements from land title and establish resource management and trading regimes to promote more efficient and sustainable water use. One of the outcomes of separating water rights from land title has been a perception by financial sector participants that these changes will lead to an increase in risk profiles and lending rates. The HLSGW report has concluded that this effect has the potential to undermine the benefits from the broader water reform agenda.

In reviewing the efficacy of arrangements established in legislation the Council will look for a system of property rights that strikes an effective balance between water users' need for security and the environments need for adaptive resource management. Water property rights regimes should maximise efficient water trade and investment subject to environmental needs.

Factors the Council is considering in relation to water property rights regimes include:

- water property rights should be well specified so as to promote efficient trade within the social, physical and ecological constraints of catchments;

- to achieve the above, property rights should be in demand, well specified in the long term sense, exclusive, enforceable and enforced, transferable and divisible and provide for sustainability and community needs;

- in establishing rights that are well specified in the long term sense there is a need to ensure water users get the highest possible level of security in regard to the nature of the property right, and absolute security on the issue of ownership;

- in relation to ownership, while a 'lease in perpetuity' maximises security, it is not required to meet minimum CoAG commitments;

- compensation may be payable, for instance, where reductions in reliabilities and other relevant parameters are capricious or disproportionate but this is not a CoAG requirement and is the purview of governments;

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5 The High Level Steering Group on Water (HLSGW) is responsible for intergovernmental coordination of the water reform agenda.

- Part IV of the Trade Practices Act could potentially be applied if the acquisition of water property rights results in a substantial lessening of competition;

- the Council will be examining the efficacy of water property rights systems for the third tranche assessment;

- water rights should be linked to a robust adaptive resource planning system; and

- any constraints on water rights and trade should be based on a sound public benefit justification and be implemented in a way that minimises impacts on efficient trade.

Provision for the environment (clauses 4(b),4(c), 4(d),4(e), 4(f))

Jurisdictions must develop allocations for the environment in determining allocations of water and should have regard to the relevant work of ARMCANZ and ANZECC. The Council will be looking for progress in implementing jurisdictional programs to be consistent with the ARMCANZ and ANZECC *National Principles for the Provision of Water for Ecosystems* (ARMCANZ/ANZECC 1996).

Best available scientific information should be used and regard had to the inter-temporal and inter-spatial water needs of river systems and groundwater systems.

The CoAG Framework requires that where river systems are over allocated or deemed stressed, there must be substantial progress by 1998 towards the development of arrangements to provide a better balance in usage and allocations for the environment.

The tripartite meeting further clarified the requirements and timeframes:

> *For the second tranche, jurisdictions submitted individual implementation programs, outlining a priority list of river systems and/or groundwater resources, including all river systems which have been over-allocated, or are deemed to be stressed and detailed implementation actions and dates for allocations and trading to the NCC for agreement, and to Senior Officials for endorsement. This list is to be publicly available.*
>
> *For the third tranche, States and Territories will have to demonstrate substantial progress in implementing their agreed and endorsed implementation programs. Progress must include at least allocation to the environment in all river systems which have been over-allocated, or are deemed to be stressed.*

> *By 2005, allocations and trading must be substantially completed for all river systems and groundwater resources identified in the agreed and endorsed individual implementation programs.*

The Council will therefore look to States and Territories to provide information demonstrating that they have:

- considered environmental contingency allocations, including the planning process (allocation, management, operation implementation, and use), monitoring and review mechanisms (the maximum timeframe allowed before review and identification of triggers prior to this time elapsing) after initial determination;

- established a sustainable balance between the environment and other uses, including formal water provisions for surface and groundwater consistent with the ARMCANZ and ANZECC national principles;

- determined and specified property rights, including the review of dormant rights;

- instituted a statewide process in setting environmental allocations, and when issuing new entitlements, have provided for environmental allocations; and

- progressed the implementation of the endorsed allocation programs as published in the Council's second tranche assessment, providing:

  – a report on which river systems (including stressed, and other overallocated systems) identified in the second tranche have fully delivered/ partially delivered/ not yet commenced allocations to the environment, as well as for river systems; and

  – a report on the status of identified stressed rivers which were not addressed in a jurisdiction's endorsed 'roll-out' plan.

The Council agreed to the implementation programs provided by jurisdictions in its second tranche assessment while noting the following relevant matters:

- The National Land and Water Resources Audit, funded under the National Heritage Trust, is currently being undertaken and will provide valuable information to jurisdictions and the Council as to any relevant systems not included in the programs or requiring a higher priority.

- The High Level Taskforce on Water Reform may, prior to the third tranche assessment, undertake to identify some relevant criteria for classifying stressed river systems. This process may result in a modification to implementation programs.

- The implementation programs, by their nature, may need to be amended depending on proposed new developments and other significant events. In particular, the ongoing assessment of unregulated subcatchments may

result in additional High Stressed Catchments being included in the timetable.

The Council therefore concluded that implementation programs may change over time, subject to agreement between the Council and a jurisdiction.

For the third tranche assessment, the Council is seeking information on progress against implementation programs which demonstrates the following outcomes.

1. Regard to the work of ARMCANZ and ANZECC

In their approaches to water planning, allocations and use, jurisdictions will have had regard to the twelve principles embodied in work of the ARMCANZ and ANZECC *National Principles for the Provision of Water for Ecosystems* (ARMCANZ and ANZECC 1996). These are provided in Box A.3.

Box A.3: ARMCANZ National Principles for the Provision of Water for Ecosystems

Principle 1 - river regulation and/or consumptive use should be recognised as potentially impacting on ecological values.

Principle 2 - provision of water for ecosystems should be on the basis of the best scientific information available on the water regimes necessary to sustain the ecological values of water dependent ecosystems.

Principle 3 - environmental water provisions should be legally recognised.

Principle 4 - in systems where there are existing users, provision of water for ecosystems should go as far as possible to meet the water regime necessary to sustain the ecological values of aquatic ecosystems whilst recognising the existing rights of other water users.

Principle 5 - where environmental water requirements cannot be met due to existing uses, action (including reallocation) should be taken to meet environmental needs.

Principle 6 - further allocation of water for any use should only be on the basis that natural ecological processes and biodiversity are sustained (that is, ecological values are sustained).

Principle 7 - accountabilities in all aspects of management of environmental water should be transparent and clearly defined

Principle 8 - environmental water provisions should be responsive to monitoring and improvements in understanding of environmental water requirements.

Principle 9 - all water uses should be managed in a manner which recognises ecological values.

Principle 10 - appropriate demand management and water pricing strategies should be used to assist in sustaining ecological values of water resources.

Principle 11 - strategic and applied research to improve understanding of environmental water requirements is essential.

Principle 12 - all relevant environmental, social and economic stakeholders will be involved in water allocation planning and decision-making on environmental water provisions.

Source: (ARMCANZ and ANZECC 1996)

2. Stressed or over-allocated rivers or aquifers

Jurisdictions will need to show that they have achieved substantial progress in meeting the commitments with regard to stressed or over-allocated systems within the timelines provided in the implementation programs as published in the second tranche assessment.

The Tripartite meeting identified that '*significant progress*' is required for the third tranche assessment and was defined to include at least allocations to the environment in all river systems which have been over-allocated, or are deemed to be stressed. Jurisdictional programs in this area must be substantially complete by 2005.

The issue of environmental allocations in stressed or over-allocated systems will be carefully scrutinised by the Council in the third tranche assessment. Jurisdictions will need to demonstrate progress in setting allocations that are adequate to meet the environmental requirements of water sources and dependent ecosystems. Jurisdictions will also need to demonstrate that there are adequate monitoring and review arrangements in place, such that allocations are able to be revised should monitoring reveal current allocation arrangements are inadequate.

The Council accepts that some jurisdictions have only recently enacted legislation which provides for full recognition of the environment's right to a share of the water resource necessary to maintain ecological values. For third tranche compliance, the Council will expect that planning and implementation mechanisms are substantially in place such that allocations to the environment can be implemented as per a jurisdiction's timetable.

In the second tranche assessment, the Council noted that implementation programs may change over time, provided there is agreement between a jurisdiction and the Council.

3. Systems not defined as stressed or over-allocated

Jurisdictions will need to demonstrate both the capacity and intention to formally provide and use scientifically based environmental allocations for all water dependent ecosystems (as defined in the ARMCANZ and ANZECC principles), thus recognising the environment as a legitimate user of water.

The Council considers that, for all rivers and aquifers not presently declared over-allocated or hydrologically stressed, there should be no impediment to developing a formal allocation for the environment if required. The Council will therefore look for evidence in future assessments that jurisdictions have forward looking mechanisms in place and operating effectively for adaptive natural resource management.

In short, the Council seeks evidence of progress for the third tranche and subsequent assessments to ensure that allocations and trading will be substantially completed for all river systems and groundwater resources by 2005 as identified in the agreed and endorse individual implementation programs.

4. Review of allocations

While jurisdictions may have used the best available scientific information to determine initial allocation decisions, they will also need to demonstrate that they have not locked in allocations which over time and in the light of better information, could be seen as being inadequate to meet environmental water requirements.

The Council expects jurisdictions to have in place a clear pathway for review of allocations within the timeframe called for in the CoAG Framework.

Water trading (clause 5)

The objective of water trading is to ensure water is used to maximise its contribution to national income and welfare, subject to the physical, social and ecological constraints of catchments. The CoAG Framework originally looked for trading arrangements in water entitlements to be instituted once the entitlement arrangements have been settled and that this should occur no later than 1998.

Jurisdictions should establish a framework of trading rules, including developing necessary institutional arrangements from a natural resource management perspective to eliminate conflicts of interest, and remove impediments to trade. The Council will consider the adequacy of trading rules to ensure that the scope for efficient trade is maximised. Where restrictions on trade exist, information should be provided on the physical, social or ecological reasons for the restrictions.

The Council will be looking for impediments to trade to be addressed and the further development of interstate trade in water. For the third tranche assessment, the Council is looking for States and Territories to:

- provide information on developments since the second tranche assessment including current trading rules, the legislative and institutional arrangements, as well as the value, volume, location and nature (for example, permanent versus temporary trades, transfers from lower to higher value uses) of inter and intrastate trades;

- Where cross-border trade is possible, trading arrangements must be consistent between jurisdictions and facilitate trade. Where trading across State borders can occur, relevant jurisdictions must review pricing and asset valuation policies to determine whether there is any substantial distortion to interstate trade. Jurisdictions should develop proposals for further extending interstate trading in water, given the framework requirement for cross border trade to be as widespread as possible (for example, the second tranche assessment calls for interstate trade between: New South Wales and Queensland as a priority; the ACT and New South Wales; and Western Australia and the Northern Territory for the Ord system); and

- demonstrate that, where restrictions remain, the benefits of the restriction outweighs the costs (for example, show that mechanisms in place for water trading do not adversely impact on river health where surface waters are traded, or in the case of groundwater, do not result in demands on aquifers that are ecologically unsustainable).

Reform commitment: environment and water quality

In relation to institutional reform:

> 6(a) that where they have not already done so, governments would develop administrative arrangements and decision-making processes to ensure an integrated approach to natural resource management;
>
> (b) to the adoption, where this is not already practiced, of an integrated catchment management approach to water resource management and set in place arrangements to consult with the representatives of local government and the wider community in individual catchments;

In relation to the environment:

> 8(a) that ARMCANZ, ANZECC and the Ministerial Council for Planning, Housing and Local government examine the management and ramifications of making greater use of wastewater in urban areas and strategies for handling stormwater, including its use, and report to the first Council of Australian Governments' meeting in 1995 on progress;
>
> (b) to support ARMCANZ and ANZECC in their development of the National Water Quality Management Strategy, through the adoption of a package of market-based and regulatory measures, including the establishment of appropriate water quality monitoring and catchment management policies and community consultation and awareness;
>
> (c) to support consideration being given to establishment of landcare practices that protect areas of river which have a high environmental value or are sensitive for other reasons; and
>
> (d) to request ARMCANZ and ANZECC, in their development of the National Water Quality Management Strategy, to undertake an early review of current approaches to town wastewater and sewage disposal to sensitive environments, noting that action is underway to reduce accessions to water courses from key centres on the Darling River system. (It was noted that the National Water Quality Management Strategy is yet to be finalised and endorsed by governments.);

NCC interpretation and benchmarks for third tranche

Integrated resource management (clause 6(a), 6(b) 8(b), and 8(c))

Jurisdictions should have in place integrated resource management practices, including:

- demonstrated administrative arrangements and decision making processes to ensure an integrated approach to natural resource management and integrated catchment management;
- an integrated catchment management approach to water resource management including consultation with local government and the wider community in individual catchments; and
- consideration of landcare practices to protect rivers with high environmental values.

The Council will examine the programs established by jurisdictions to improve approaches for integrated resource management. Programs should desirably address such areas as government agency coordination, community involvement, coordinated natural resource planning, legislation framework, information and monitoring systems, linkages to urban and development planning, support to natural resource management programs and landcare practices contributing to protection of rivers of high environmental value.

Integrated catchment management

It is important that jurisdictions demonstrate that the catchment management planning process is free from domination by narrow sectoral interests to ensure decisions reflect the balance of interests within the wider community. Genuine stakeholder participation in catchment planning requires agreement to the principles underpinning the plan such as cost sharing arrangements, acceptable basin impacts, and allowable tradeoffs amongst water users. Appropriate institutional arrangements should ideally have a statutory underpinning.

The Council is aware that there has been little guidance developed to date to address issues of integrated catchment management. The Council notes the House of Representatives Standing Committee on Environment and Heritage is conducting an inquiry into catchment management practices in Queensland, New South Wales, South Australia, Western Australia, ACT and Victoria, and is expected to report its findings shortly.

The Council proposes to review the process followed by each jurisdiction to ensure effective implementation of catchment management practices. Further, the Council will also take account of any reviews by jurisdictions in this area and whether the findings of these reviews are being implemented.

Information provided by jurisdictions could include:

- a description of the overall coordinating body including its composition and functions relating to natural resource management and links to regional/local government bodies;

- a description of the process whereby catchment management bodies (trusts, committees, councils, or groups) are formed including how the local community, local government, and state agencies are involved;

- a description of the statutory basis of catchment management plans/strategies and capacity and mechanisms to enforce actions identified in the plan;

- a description of the framework used to assist catchment managers to evaluate/review the effectiveness of a catchment management process; and

- a description of landcare practices (including extent of coverage) that protect areas of river which have a high environmental value.

National Water Quality Management Strategy (clauses 8(b) and 8(d))

The National Water Quality Management Strategy (NWQMS) aims to deliver a nationally consistent approach to water quality management. It is being developed in response to growing community concern about the condition of the nation's water. The policy objective is '*to achieve sustainable use of the nation's water resources by protecting and enhancing their quality while maintaining economic and social development*.'

The Council is proposing to take the following approach for the third tranche assessment.

- Each jurisdiction should be able to demonstrate a high level of political commitment and a jurisdictional response to ongoing implementation of the principles contained in the NWQMS guidelines, including to achieving the policy objectives. Such commitment should include the development of practical on-the-ground action, which might involve the use of legislation, policy instruments, programs or plans. These should contain provisions which are consistent with the guidelines, and scope for review.

- Each jurisdiction should have a publicly stated commitment to implementing the principles identified in the Strategy and have implemented an approach for adopting the scientific framework outlined in the *Australian Water Quality Guidelines for Fresh and Marine Waters* (ANZECC 1992). There should be an appropriate statewide approach to water quality management.

- Each jurisdiction should have in place a water reform program that integrates water quality and quantity management requirements in their

approaches to land-use planning. In relation to water quality, this program should target the attainment of the ambient environmental quality objectives set in consultation with the community.

- All relevant legislative, regulatory and policy measures to protect water quality should, where practicable, be consistent with the *Implementation Guidelines for the NWQMS* (ARMCANZ and ANZECC 1998). In particular, they should include measures to promote:

  – integrated resource management;

  – identification of environmental values and associated water quality objectives; and

  – catchment, coastal and groundwater management planning.

Each jurisdiction should be able to demonstrate use of the relevant national guidelines. Where necessary, jurisdictions should have produced local guidelines or codes of practice consistent with the national guidelines so far completed for those industries covered under the NWQMS. The national guidelines seek adoption of local guidelines to underpin the regulation of each of the activities covered.

The strategy for the achievement of sustainable water quality management should build on a full mix of approaches including, but not limited to, regulatory and market based approaches, education and guidance. This is supported by CoAG. Market-based approaches should play a complementary role in achieving protection and enhancement of water quality where appropriate.

Where modules have been finalised, jurisdictions must have finalised their approach and initiated market-based and regulatory activities and measures such as water quality monitoring, catchment management policies, town wastewater and sewerage disposal and community consultation and awareness to give effect to the NWQMS.

Jurisdictions should support ANZECC and ARMCANZ in the development of the remaining modules of the NWQMS.

Reform commitment: public consultation and education

In relation to consultation and public education:

> 7(a) to the principle of public consultation by government agencies and service deliverers where change and/or new initiatives are contemplated involving water resources;

(b) that where public consultation processes are not already in train in relation to recommendations (3)(b), (3)(d), (4) and (5) in particular, such processes will be embarked upon;

(c) that jurisdictions individually and jointly develop public education programs in relation to water use and the need for, and benefits from, reform;

(d) that responsible water agencies work with education authorities to develop a more extensive range of resource materials on water resources for use in schools; and

(e) that water agencies should develop individually and jointly public education programs illustrating the cause and effect relationship between infrastructure performance, standards of service and related costs, with a view to promoting levels of service that represent the best value for money to the community;

NCC interpretation and benchmarks for third tranche

Consultation prior to change (clauses 7(a) and 7(b))

Jurisdictions must have consulted on the significant CoAG reforms (especially water pricing and cost recovery for urban and rural services, water allocations and trade in water entitlements). The Council will examine the extent and the methods of public consultation, with particular regard to pricing, allocations and water trading.

Public education programs (clauses 7(c), 7(d) and 7(e))

Education programs related to the need for and benefits of reform should be developed. Evidence should also be provided of agencies working individually and jointly to develop public education programs that illustrate the need for reform, and general awareness of water related issues. This could include the relationship between infrastructure performance, standards of service and related costs. These programs should promote levels of service that represent the best value for money to the community.

The Council will look for evidence that responsible agencies are working with education authorities to develop a more extensive range of resource materials for use in schools.

The Council noted in the second tranche assessment that there is a potential conflict in the service provider being responsible for determining the level of ongoing public education on water conservation when it has a financial

interest in increased water consumption. The Council is interested in information on measures used by jurisdictions (for example, an effective purchaser provider split) to address this issue, including programs offered by service providers as 'good corporate citizens'.

Reviewing and reforming water legislation: the CPA commitment

As well as implementing the CoAG Framework, governments agreed to ensure the water industry is subject to clause 5 of the CPA. This commits governments to ensuring that legislation does not restrict competition unless the benefits of the restriction to the community as a whole outweigh the costs and the objectives of the legislation can only be achieved by restricting competition.

Legislative reform was important for meeting a number of second tranche water reform commitments in relation to, for example, water allocations and trading, institutional separation and resource management. Until recently a key third tranche issue was the risk that jurisdictions may not have implemented amendments to legislation by the year 2000 deadline, in line with the CPA legislation review commitments.

However, in November 2000 CoAG agreed that the 2000 deadline for the full completion of all jurisdictions' legislation review programs should be extended to 30 June 2002. Accordingly, the Council will continue to monitor progress and look for full implementation by 30 June 2002, with a robust public interest justification provided for any delays beyond this date.

For the third tranche, the Council is looking for jurisdictions to provide a status report on reviews of water legislation including whether a piece of legislation has been repealed by passage of new legislation. Where a government chooses to continue a restriction on competition, or not to apply recommended reforms, the Council will require evidence in the annual report of the public interest justification or why non-implementation benefits the community.

Appendix B: Water trading

Governments have agreed that water trading arrangements should be in place to so as to maximise water's contribution to national income and welfare, within the social, physical and ecological constraints of catchments.

Consistent with commitments under Clause 5 of the CoAG framework, the objective of water trading is to ensure water is used to maximise its contribution to national income and welfare, subject to the physical, social and ecological constraints of catchments. The Council's view is that, as far as possible, water rights regimes should facilitate trading that maximises the value of the resource with any restriction on trade being transparent and based on a sound public benefit.

In assessing compliance with Clause 5 of CoAG framework, the Council has looked for the following matters to be given due consideration:

- a clear definition of sustainable water rights; (that is, what is being traded)
- clear water trading zones and rules; (that is, where and how trade can occur)
- robust markets and trading procedures; (clearance and facilitating trade)
- a number of market choices;
- accessible and equitable market information;
- certainty, confidence and timeliness; and
- capital efficiency.

This approach is consistent with the High Level Steering Group on Water report 'A National Approach to Water Trading' (2000).

In making its assessment the Council recognises that the means through which each of the above issues are addressed will vary from jurisdiction to jurisdiction. That said, as trading in most jurisdictions is still in its infancy, the assessment has focussed on the establishment of mechanisms, policies and information that provide a sound foundation for efficient water trading. Particular focus in this assessment has therefore been extended to:

- the clear definition of property rights;
- adequate specification of appropriate trading rules and zones;

- appropriate market procedures; and
- accessible and equitable market information.

In future assessments, the Council will look for evidence of effective trade in areas of demand and measures to be in place to increase the depth of water trading markets.

Definition of water entitlements

Well-defined property rights are essential for efficient water trade. Efficient trade in water rights requires that market participants are able to form a reasonable expectation about the magnitude and distribution of the benefits likely to be provided by the water right and the likelihood that those benefits will be realised. That is, water rights must be well defined in terms of both:

- *the nature of the right* – the benefits promised by holding the water right; and
- *ownership* – the right holders ability to realise those benefits.

In addition, transitional mechanisms that allow for the movement to a system of sustainable property rights should be open and transparent so that potential market participants understand the impact upon their water rights.

Discussion on the definition of water entitlements has been given in the allocations section. Therefore, the focus in this chapter will be solely upon the impact of these issues on the efficacy of inter- and intra- state trading markets.

Nature of the right

Efficient water trade, consistent with the clause 5 objective of maximising water's contribution to national income, requires that buyers and sellers have a clear understanding of exactly what they are trading. This includes clear specification of the volume, ownership, reliability and, if appropriate, quality of the water provided by the right over time. Poorly defined rights increase the risks associated with holding a water right, which is likely to discourage beneficial trade and investment that would have otherwise occurred.

Ownership

Uncertainty about the individual right holder's security of tenure can impede efficient trade and investment. Rights covering only a short time or which have significant risk of uncompensated reductions in the share of the available resource provided for the duration of the water right mean that water users are more uncertain about whether they will have access to the water in the future. This can be a significant issue, particularly when

considering major investments in assets with long lives with little or no resale value. Key issues in ensuring that water rights' security of ownership of water rights is maximised include the duration of the right, ensuring that the right is enforced, the quality of the title and establishing rights that are transferable and divisible.

Water trading zones and rules (where and how people can trade)

Efficient and effective trading requires clearly defined trading zones and rules. Uncertainty about where and under what conditions trading can take place can discourage mutually beneficial trades. Where trading rules and zones are used to pursue environmental or community objectives, this should be done in a way that minimises the impact on efficient trade.

Markets and trading procedures

As noted by the High Level Steering Group on Water's Report, any financial transaction involves risk to the participants (including payment to the seller and delivery to the buyer). However, water trade involves an important set of additional risks relating to environmental impacts and third party effects. If water trading is to maximise water's contribution to national income and welfare, transparent and efficient clearance procedures must be in place to address risks to both market participants and third parties.

Where precautionary measures are put in place, it is important to:

- separate legitimate from illegitimate reasons for restricting trade;
- recognise that social impacts should not be ignored but should be addressed in their own right;
- examine and improve the efficacy and efficiency of legitimate restrictions; and
- balance the need for appropriate protection for buyers, sellers and third parties, generally through buyer and seller checks, with the need for timely processing of trade applications.

Ideally, sufficient information should be provided to allow potential buyers and sellers to shop around and compare water prices, transaction fees and services offered by water brokers and water exchanges.

Market choices

The HLSGW Report notes that it is important for potential market participants to have a wide choice in the manner in which their trade is conducted. There are three main mechanisms for trade:

- Private trade;
- Water brokers; and
- Water exchanges.

While it is not essential to have all of these options available for all trades, a variety of mechanisms for trade will only benefit trading markets. A variety of trading mechanisms usually results in the wider public availability of information regarding trading mechanisms, availability and price and encourages participation in the market as buyers and sellers can make a reasonable estimate of the value of their water. As well as providing a mechanism for trade, a water exchange is one way in which market information can be provided effectively. Evidence suggests that these exchanges also facilitate trade by providing a price-setting function for private sales in the region

Market information

Water trading will only maximise the resources contribution to income and welfare when actual and potential market participants have enough and equal information to make and informed decision about a particular trade. As noted by the HLSGW Report an effective market depends on buyers and sellers having access to timely and relevant quality information on the key questions of:

- what is being traded;
- where can water be traded to and from;
- how trades can be executed;
- what are the procedures; and
- what are the risks and can these be managed.

The Report also notes the value of water exchanges as a forum for the dissemination of market information and price information. Evidence suggests that exchanges also serve a price setting function for private sales.

Certainty, confidence and timeliness

It is important for potential market participants to fully understand the risks involved with participation in the market and that these risks be minimised. As such, the High Level Steering Group on Water report notes that:

> *Governments should ensure that trading is as open and transparent as possible and should seek to minimise any artificial impediments to trade.*

Market transparency could be accomplished through easily available market information and information on trading rules, practices and procedures. This would include clear specification of water property rights, especially in terms of the nature of the right and ownership. Governments should work to remove any impediments to effective trade, and ensure that remaining impediments are based on sound public benefit and be the least distortionary means possible.

Capital efficiency

Improved capital efficiency of water entitlements and property rights is a key outcome of the better specification of property rights and the development of trading markets. Water entitlements are valuable capital assets, and in many areas, are more valuable than the land they used on. A water user with a water entitlement of 5000ML could potentially own a resource with a value in excess of $5million.

As such, water users need flexibility in the methods of managing water as a capital asset. These methods may include:

- Mortgage security;
- Leased for one or many years in the same manner as vehicles and equipment, rather than purchased outright;
- Sold to a financier and leased back; and
- Subject to conditional sale, purchase or lease contracts and other forms of options.

It should be noted that mechanisms to improve capital efficiency as described, particularly the latter two, are generally found only in developed, or mature, markets. As water markets are generally still in their infancy, the Council will not be requiring a specific suite of these mechanisms in its third tranche assessment. Instead, the Council has looked for the appropriate basis to exist for the development of these options, and consideration by Governments of how markets may be improved in future assessments.

References

ANCID (Australian National Committee on Irrigation and Drainage) 2001, *Australian Irrigation Water Provider Benchmarking Report for 1999-2000*, Tatura.

Bjornlund, H. and McKay, J. 2001, 'Operational Aspects of Australian Water Markets', *Focus on Water*, Third Australasian Natural Resources Law and Policy Conference, Adelaide, pp. 50 - 69

CSIRO Land and Water 2000, *Inter-state Water Trading: A Two Year Review* Murray Darling Basin Commission, Canberra.

—— 2001, *Who Dares Wins: Opportunities to Improve Water Trading in the South-East of South Australia,* Canberra.

DWR (Department for Water Resources) 2000a, *State Water Plan 2000,* Department for Water Resources, Adelaide.

—— 2000b, *Water Allocation Plan Clare Valley Prescribed Water Resources Area,* Department for Water Resources, Adelaide.Dunlop M, Hall N, Watson B, Gordon L and Foran B. 2001, *Water Use in Australia,* CSIRO Land and Water, Canberra.

Environment Protection Agency (n.d.), *The Roles, Responsibilities and Framework for Water Monitoring in South Australia*, Adelaide.

—— (n.d.), *Draft Environment Protection (Water Quality) Policy and Explanatory Report,* Adelaide.—— 2000a, *The State of Health of the Mount Lofty Ranges Catchments from a Water Quality Perspective*, Stirling.High Level Steering Group on Water 2000, *A National Approach to Water Trading*, Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) and the Australian and New Zealand Environment and Conservation Council (ANZECC), Canberra.

—— 2001, *Draft Guidelines for Managing Externalities: Restoring the Balance*, Adelaide.

Murray-Darling Basin Commission 2001, *Review of Cap Implementation 1999-2000: Report of the Independent Audit Group*, Canberra.

NCC (National Competition Council) 1999, *Second Tranche Assessment: 1999, AusInfo,* Canberra

—— 2000a, *Supplementary Second Tranche Assessment: 30 June 2000*, AusInfo, Canberra.

—— 2000b, *Supplementary Second Tranche Assessment: 30 September 2000*, AusInfo, Canberra.

NLWRA (National Land and Water Resources Audit) 2001a, *Australian Water Resources Assessment 2000*, Natural Heritage Trust, Canberra.

—— 2001b, *Dryland Salinity Assessment 2000,* Natural Heritage Trust, Canberra.

Northern Adelaide and Barossa Catchment Water Management Board 2000a, *Water Allocation Plan Northern Adelaide Plains Prescribed Wells Area,* Adelaide.

—— 2000b, *Water Allocation Plan Barossa Prescribed Water Resources Area,* Adelaide.

—— 2001, *Catchment Water Management Plan,* Adelaide.

Onkaparinga Catchment Water Management Board 2000a, *Water Allocation Plan McLaren Vale Prescribed Wells Area,* Adelaide.

—— 2000b, *Onkaparinga Catchment Water Management Plan,* Adelaide.

South Australia 2000*, State Water Plan 2000,* Adelaide

—— 2001a, *2001 NCP Annual Report*, Adelaide

—— 2001b, *Draft Integrated Natural Resource Management Bill: Request for Comments & Explanatory Paper*, Adelaide.

SA Water 1999, *Water Pricing in South Australia*, Discussion paper, Adelaide.

—— 2000, *Annual Report 2000*, Adelaide.

—— www.sawater.com.au

WSAA (Water Services Association of Australia) 2000, *WSAA facts 2000*, Melbourne.