MURRAY-DARLING BASIN COMMISSION

ANNUAL REPORT 2002 – 2003

To the Parliaments of the Australian Government, New South Wales, Victoria, South Australia and Queensland; the Legislative Assembly of the Australian Capital Territory; and the Australian community

This report includes the annual report of the Murray-Darling Basin Commission’s Community Advisory Committee
THE MURRAY-DARLING BASIN
24 February 2004

The Hon. Warren Truss MP
Minister for Agriculture, Fisheries and Forestry
Parliament House
CANBERRA ACT 2600

Dear Minister

In accordance with clause 84(1) of the Murray-Darling Basin Agreement 1992, I submit our annual report and financial statements covering the year ended 30 June 2003 for tabling before the Parliaments of the Australian, New South Wales, Victorian, South Australian and Queensland governments.

The year 2002/03 was a year of extreme drought across most of the Murray–Darling Basin with communities experiencing severe hardship. It was pleasing to note the high level of cooperation between governments and communities in dealing with these extreme conditions and coping with the threat of water restrictions.

Community discussion on The Living Murray was highly focused on the environmental benefits that may be expected from the program, how the water would be sourced and the potential impacts on communities. Information to address these issues was developed through the year and should provide a suitable basis for ongoing dialogue with the community.

I commend the Murray-Darling Basin Commission Annual Report 2002–2003 to the five parliaments and the Legislative Assembly, and I look forward to the partner governments continuing support of the Murray-Darling Basin Initiative.

Yours sincerely

ROY GREEN
President
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<td>Murray-Darling Basin Agreement</td>
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<tr>
<td>ANZLIC</td>
<td>Australia and New Zealand Land Information Council</td>
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<tr>
<td>ASDD</td>
<td>Australian Spatial Data Directory</td>
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<td>Basin</td>
<td>Murray–Darling Basin</td>
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<tr>
<td>BCTS</td>
<td>Baseline Conditions Technical Subcommittee</td>
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<td>BSMS</td>
<td>Basin Salinity Management Strategy</td>
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<tr>
<td>BSMSIWG</td>
<td>Basin Salinity Management Strategy Implementation Working Group</td>
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<td>CAC</td>
<td>Community Advisory Committee</td>
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<td>Cap</td>
<td>Cap on Diversions</td>
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<td>cm</td>
<td>centimetre</td>
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<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>DSNR</td>
<td>Department of Sustainable Natural Resources</td>
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<td>MDBC Office</td>
<td>Murray-Darling Basin Commission office</td>
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<td>EC</td>
<td>electrical conductivity</td>
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<td>FPRG</td>
<td>Fish Passage Reference Group</td>
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<td>GFS</td>
<td>groundwater flow systems</td>
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<td>GIS</td>
<td>geographic information system</td>
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<td>GL</td>
<td>gigalitre</td>
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<td>GWh</td>
<td>gigawatt hour</td>
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<td>IAG</td>
<td>Independent Audit Group</td>
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<td>ICEP</td>
<td>Independent Community Engagement Panel</td>
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<td>ICM</td>
<td>integrated catchment management</td>
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<td>ICM Policy</td>
<td>Integrated Catchment Management Policy</td>
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<td>IMIRS</td>
<td>irrigation management information reporting system</td>
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<td>InfoBank</td>
<td>MDB InfoBank project</td>
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<td>Initiative</td>
<td>Murray-Darling Basin Initiative</td>
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<td>IPWG</td>
<td>Implementation Plan Working Group</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>IQQM</td>
<td>integrated quantity and quality model</td>
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<td>IT</td>
<td>information technology</td>
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<td>KPA</td>
<td>key performance area</td>
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<td>metre</td>
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<td>MDBC</td>
<td>Murray-Darling Basin Commission</td>
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<td>MDRIN</td>
<td>Murray Darling Rivers Indigenous Nations</td>
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<td>MIL</td>
<td>Murray Irrigation Limited</td>
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<td>Ministerial Council</td>
<td>Murray-Darling Basin Ministerial Council</td>
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<td>ML</td>
<td>megalitre</td>
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<td>MSM</td>
<td>monthly simulation model</td>
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<td>µS</td>
<td>microSiemens</td>
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<td>NAP</td>
<td>National Action Plan for Salinity and Water Quality</td>
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<td>NFS</td>
<td>Native Fish Strategy</td>
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<td>NHT</td>
<td>Natural Heritage Trust</td>
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<td>Natural Heritage Trust Extension</td>
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<td>NLWRA</td>
<td>National Land and Water Resources Audit</td>
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<td>NRM</td>
<td>natural resources management</td>
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<td>OH&amp;S</td>
<td>occupational health and safety</td>
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<td>PMSEIC</td>
<td>Prime Minister’s Science, Engineering and Innovation Council</td>
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<td>R&amp;D</td>
<td>research and development</td>
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<td>REALM</td>
<td>resource allocation model</td>
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<td>REP2</td>
<td>Murray Regional Environmental Plan No 2</td>
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<td>RMEM</td>
<td>River Murray Environmental Manager function</td>
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<td>RMW</td>
<td>River Murray Water</td>
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<td>S&amp;D</td>
<td>salinity and drainage</td>
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<tr>
<td>SI&amp;E</td>
<td>Strategic Investigations and Education</td>
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<td>SIMRAT</td>
<td>salinity impact rapid assessment tool</td>
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<td>SPD</td>
<td>Special Policy Development</td>
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<td>SRA</td>
<td>Sustainable Rivers Audit</td>
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The Murray-Darling Basin Commission (MDBC) is a unique organisation, involving the Australian, New South Wales, Victorian, South Australian, Queensland and the Australian Capital Territory governments. The MDBC was created because the governments wanted an organisation that transcended the political boundaries between these jurisdictions to manage the far-reaching Murray–Darling river catchments as effectively as possible.

This report describes the objectives and significant achievements of the MDBC during the 2002/03 financial year. It is tabled before the parliaments of each jurisdiction through the Murray-Darling Basin Ministerial Council (Ministerial Council). This tabling process has been developed to meet the requirements of the 1992 Murray-Darling Basin Agreement which has been incorporated into legislation and passed by the Australian Government and State parliaments that have jurisdiction in the Murray–Darling Basin (Basin). The Australian Capital Territory’s involvement is through a memorandum of understanding.

The MDBC undertakes works and measures at the direction of the Ministerial Council, and coordinates the efforts of the government partners to the Murray-Darling Basin Initiative (Initiative). This annual report focuses mainly on those activities that the MDBC has carried out on behalf of the Ministerial Council in 2002/03. Information on the 2002/03 activities of the partners to the Initiative will be available through the States’ annual reports to the MDBC and the Ministerial Council, expected to be provided by early 2004.

This annual report also incorporates the annual report of the Ministerial Council’s Community Advisory Committee, the primary community body advising the Ministerial Council on natural resources management issues in the Basin.
OVERVIEW

The 2002/03 year was one of extreme drought across the Murray–Darling Basin (Basin). The last time the Basin faced such severe drought was in 1982/83 when the demand for irrigation water was significantly less. As a result, the year has produced many challenges for the communities of the Basin, as well as for their agencies. A summary of the major issues follows.

Drought

The Murray-Darling Basin Commission (MDBC) started the 2002/03 Murray irrigation season with 48% of active reserve in its storages. Inflows over the spring and summer approached historical low levels with temperatures being well above those recorded over the last 50 years. The significant water reserves—mainly in Dartmouth Reservoir—at the commencement of the year enabled:

- South Australia to receive its entitlement flows;
- allocations to Victorian irrigators to reach 129% of water right;
- allocations to New South Wales high security irrigators of 100%; and
- allocations to New South Wales general security of 10%.

Reserves at 30 June 2003 were at 21% of active storage which means that, unless very significant inflows over the winter/spring months occur, allocations will be at record low levels during the next season. Similar issues were faced on the Goulburn and Murrumbidgee systems.

Fires

An outcome of the persistent drought conditions, high temperatures and low humidities was the disastrous series of bushfires that swept through alpine Victoria, the ACT and New South Wales in January 2003. The scale of this disaster had not been experienced since the summer of 1939. Some 50% of the catchment above Hume Reservoir, including most of the catchment above Dartmouth, was impacted by bushfire; in some cases understorey and crowns of forested areas being almost completely destroyed. Some 20% of the catchments of the Kiewa and Ovens systems were also affected.

In the immediate term, major fire-related problems are to water quality and the deposition of ash and debris in storages and streams. In the longer term, as forests regenerate, a significant water yield reduction over the next 20–25 years can be expected. On behalf of the MDBC, I acknowledge the extraordinary and selfless efforts of communities, fire and emergency services and staff located at MDBC storages in responding to this awesome event.
Salinity

Salinity levels in the River Murray were at their lowest level for over 40 years with salinities at Morgan between 300 and 400 EC over summer and autumn. This was due to:

- most water being sourced from Hume and Dartmouth;
- drainage and downstream tributary flows being at low levels; and
- the MDBC’s salt interception facilities being all fully operational.

An exception to this trend was the salinity in the lower lakes (Alexandrina and Albert) at around 2000 EC during summer and autumn, with pockets of salinity in the Goolwa channel exceeding 4000 EC. Salinity in the lower Darling reached 2190 EC at Burtundy.

Engineering awards

The MDBC, with its constructing authority the South Australian Water Corporation, won both the Environmental Engineering Award and the Sir William Hudson Engineering Award for the construction of its salt interception schemes in South Australia. It was rewarding to see such innovative environmental assets being recognised by these national awards and my congratulations go to our partners for their efforts.

The Living Murray

The major public policy issue of the Murray-Darling Basin Ministerial Council (Ministerial Council) continues to be The Living Murray initiative. Work continued throughout the year on informing the public on issues associated with balancing consumptive use and maintaining key environmental values of the River Murray. Work also continued on developing the knowledge base necessary to inform Ministerial Council decisions on this matter. This work included the development of a framework for environmental assessment—the Murray Flow Assessment Tool—and the ongoing assessments of the social and economic impact of various options.

The Basin’s communities are to be commended for being able to separate the very difficult drought circumstances from the longer-term issues associated with The Living Murray initiative. Much work still needs to be done before the community will have confidence on an appropriate way forward and this remains a major challenge over coming years.
The Murray Mouth

During the year the Murray Mouth came close to closing. The MDBC authorised commencement of dredging to maintain an opening at the mouth and connection with both the Goolwa Channel and the Coorong. This has been successful, although its ongoing effectiveness will be controlled by the weather. If dry conditions remain, it could be one or more years before there are any flows from the Murray Mouth and ongoing dredging may be necessary. No River Murray flows have passed the barrages into the Murray Mouth since November 2001.

The South Australian agencies are to be commended for obtaining the necessary clearances in record time to allow dredging to commence.

The Darling/Menindee lakes

On 14 March 2002 the Menindee Lakes system fell below 480 GL at which time control of remaining water reverted to New South Wales. A re-survey of Lake Wetherall under low storage conditions indicated that it held less water than was previously estimated, thus placing further strain on the storage system.

No significant inflows to the Darling system occurred over the summer months and water supply on this system remains in a stressed state.

Basin Salinity Management Strategy

The Ministerial Council agreed to a new Schedule C to the Murray-Darling Basin Agreement (Agreement) and to implement the Basin Salinity Management Strategy. This was followed by MDBC-agreed protocols that specify how all parties handle the implementation. This agreement completes a challenging policy that started with the 1998 review of the successful Salinity and Drainage Strategy and establishes an accountability framework for both diffuse and point contributions of salinity across the Basin. It is the largest such accountability system on earth.

Cap management

Management of the Cap on Diversions (Cap) continues to proceed satisfactorily in accordance with Schedule F of the Agreement. Two New South Wales rivers, the Gwydir and Lachlan, were declared in breach of the Cap, and New South Wales is now taking the necessary action to bring those valleys back into balance.

Community Advisory Committee review

Council authorised a review of its Community Advisory Committee to ensure it was structured to meet the emerging issues of the new century. The Ministerial Council will consider the review early in 2003/04.
Sustainable Rivers Audit

The Sustainable Rivers Audit project initiated four pilot studies to test methodology and assessment techniques. These projects have proceeded satisfactorily and will be the basis of a business case for the Ministerial Council to determine whether a common assessment technique is necessary and appropriate in monitoring and reporting on river health across the Basin. Assessments under the pilot project also discovered species not previously identified in the Basin.

Native Fish Strategy

The Ministerial Council, after a period of active community consultation, endorsed the Native Fish Strategy. The strategy complements other strategies and the fish passage works program under The Living Murray initiative within the Ministerial Council’s integrated catchment management framework. Importantly the strategy contained an investment framework to guide MDBC, State and community investment in actions to improve native fish stocks across the Basin.

Carp control

The MDBC has entered a long-term contract with the Cooperative Research Centre for Pest Animal Control, to develop ‘daughterless carp’ technology as a way of controlling carp populations. Work to date looks promising but there is much to do before this technology will be available for release.

I would like to thank all of my colleagues in the MDBC Office who have worked tirelessly under very trying circumstances during 2002/03.

I would also like to thank the many hundreds of community members who have made their time available to assist in the development and implementation of the Ministerial Council’s various strategies and programs throughout the year.

DJ Blackmore
Chief Executive
THE MURRAY-DARLING BASIN INITIATIVE

Windrowing canola near Wellington, Macquarie catchment, NSW

Photo: Peter Solness
The Murray-Darling Basin Initiative (Initiative) is the partnership between governments and the community that has been established to give effect to the 1992 Murray-Darling Basin Agreement (Agreement). The purpose of the Agreement is:

... to promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.

In its early years the Initiative focused on promoting the principles of integrated catchment management (ICM) and the development of joint community and government structures. These have remained key mechanisms for achieving sustainable use of the Basin’s natural resources. More recently, emphasis has been placed on the development and implementation of strategic, large-scale ICM plans, concentrating resources in the areas of greatest need and establishing an ICM framework that will help governments and communities to better address issues such as dryland salinity over the next decade.

A major focus within this framework has been to obtain a long-term sustainable future for rivers in the Basin and in particular the River Murray. The Initiative brings together communities, and the Australian, New South Wales, Victorian, South Australian, Queensland and Australian Capital Territory governments. The overall governance of the Initiative is shown in Figure 1 and described in the following sections.

1.1 Murray-Darling Basin Ministerial Council

The Murray-Darling Basin Ministerial Council (Ministerial Council) is the primary body responsible for providing the policy and direction needed to implement the Initiative. The council’s main functions are to consider and determine major policy issues concerning the use of the Basin’s land, water and other environmental resources; and to develop, consider and authorise (as appropriate) measures to achieve the purpose of the Agreement.

The Ministerial Council is made up of the Ministers holding land, water and environment portfolios within the Australian, New South Wales, Victorian, South Australian and Queensland governments. As many as three ministers from each government may sit on the council. The Australian Capital Territory participates in the Initiative through a memorandum of understanding. The memorandum allows the Australian Capital Territory to take part in planning and management of Basin environmental resources, but not to be involved in water management of the River Murray system. The memorandum provides for an Australian Capital Territory Government minister to be a non-voting member of the Ministerial Council.

Names of members of the Ministerial Council are shown in Appendix A.
Figure 1. Governance of the Murray-Darling Basin Initiative (as at 30 June 2003).

**COMMUNITY**

Murray-Darling Basin Ministerial Council
Ministers holding land, water and environment portfolios in each contracting government
(Australian Government, New South Wales, Victoria, South Australia, Queensland)*

Murray-Darling Basin Commission
Independent President; commissioners/deputy commissioners representing each contracting government (senior executives from land, water and environment agencies)*

Community Advisory Committee
Chair, catchment and special interest representatives

Project boards
- River Murray Water Board
- Water Policy Committee
- ICM Policy Committee
- Finance Committee

Working groups

Commission Office: technical and support staff
- Water Business
- Basin Sustainability

**Principal government agencies**

**AUSTRALIAN GOVERNMENT**
- Agriculture, Fisheries and Forestry – Australia
- Department of Environment and Heritage

**NEW SOUTH WALES**
- Department of Land and Water Conservation (1 July 2002 – 31 March 2003)
- Department of Sustainable Natural Resources (from 1 April 2003)
- NSW Agriculture Environment Protection Authority

**VICTORIA**
- Department of Natural Resources and Environment
- Goulburn-Murray Water

**SOUTH AUSTRALIA**
- Department of Primary Industries and Resources SA
- Department of Water, Land and Biodiversity Conservation
- South Australian Water Corporation
- Department for Environment and Heritage

**QUEENSLAND**
- Department of Natural Resources and Mines
- Environment Protection Agency

**AUSTRALIAN CAPITAL TERRITORY**
- Environment ACT

* Participation of the Australian Capital Territory is through a memorandum of understanding (see Section 1.1)
1.2 Community Advisory Committee

The Ministerial Council’s Community Advisory Committee (CAC) is an integral part of the Initiative and reflects the importance of the community–government partnership. At its first meeting in 1986, the Ministerial Council established the CAC to advise them on natural resources management issues identified by the Basin community. This decision was based on the Ministers’ earlier recognition of the need for ...

... effective community participation in the resolution of the water, land and environmental problems in the Basin.

The terms of reference of the CAC are to advise the Ministerial Council and Murray-Darling Basin Commission (MDBC) on:

- natural resources management issues that have been referred to CAC by the Ministerial Council or MDBC; and
- the views of the Basin’s communities on matters identified by the CAC as being of concern.

The CAC has an independent Chairman and 28 members. Twenty-three members are State representatives chosen on a catchment or regional basis—seven from New South Wales, nine from Victoria, four from South Australia, four from Queensland and one from the Australian Capital Territory. Additionally there is a representative from each of four special interest peak organisations, and an appointee to provide an Indigenous perspective on natural resources management issues.

The CAC works closely with the Ministerial Council and the MDBC, and actively participates in a wide range of MDBC committees and working groups.

The names of members of the CAC during the year are listed in Appendix B. The CAC’s contribution is discussed in detail in Chapter 2.
COMMUNITY ADVISORY COMMITTEE KEY MESSAGES

What we are

The CAC:
- was established by legislation—the *Murray-Darling Basin Agreement* (Clause 14);
- is appointed by and reports directly to the Ministerial Council;
- is the peak community body in the Basin bringing a collective wisdom and range of community perspectives on natural resources management;
- was established to provide community advice on natural resources management issues directly to the Ministerial Council; and
- is a unique forum for sharing information about natural resources management in the Basin.

Our aspirations and commitments

- The CAC is committed to the *Initiative*. Change required to implement ICM in the Basin must be the initiative of the people of the Basin. It is people working in partnership with governments who will effect implementation of ICM in the Basin.
- The CAC is visionary—it looks at the ‘big picture’ and takes the long-term view.

How we do things

- The CAC has representatives from the 23 Basin catchments plus five special interest groups—National Farmers Federation, Australian Landcare Council, Indigenous peoples, Australian Conservation Foundation and Australian Local Government Association. It meets formally three times a year throughout the Basin.
- The CAC wants and needs to hear what the people in the Basin know and think, and it appoints individuals to provide a grounded community perspective to MDBC working groups, committees and project boards. It is independent of, but works collaboratively with, the MDBC and provides a direct conduit from the Basin community to the Ministerial Council.
- The CAC helps to form, and adds value to, natural resources management priorities and policies of the *Initiative*. It provides independent, professional and credible advice that is apolitical and independent of jurisdictions.
1.3 The Murray-Darling Basin Commission

The MDBC is the executive arm of the Ministerial Council and is responsible for managing the Menindee Lakes system of the lower Darling River and the River Murray, and for advising the Ministerial Council on matters relating to the use of the water, land and other environmental resources of the Basin.

The MDBC is responsible for:

- advising the Ministerial Council in relation to the planning, development and management of the Basin’s natural resources;
- assisting the Ministerial Council in developing measures for the equitable, efficient and sustainable use of the Basin’s natural resources;
- coordinating implementation of these measures or, where directed by Ministerial Council, implementing them; and
- giving effect to any policy or decision of the Ministerial Council.

In meeting its responsibilities, the MDBC is:

- developing a Basin-wide framework for the sustainable management of its water, land and other environmental resources; and
- actively participating in the Initiative through operating the River Murray system and managing and/or coordinating Basin-wide policy, planning and knowledge generation activities.

The MDBC is made up of an independent President, two commissioners from each contracting government and a representative of the Australian Capital Territory Government (each contracting government also appoints two deputy commissioners). Apart from the President, commissioners are normally chief executives and senior executives of the agencies responsible for stewardship of land, water and the environment. The memorandum of understanding for the participation of the Australian Capital Territory Government (see Section 1.1) provides for a non-voting ‘representative’ from the Australian Capital Territory to participate in meetings of the MDBC.

Names of members of the MDBC (including the names of deputy commissioners) are shown in Appendix C.

Achieving an outcome of equitable, efficient and sustainable use of the Basin’s environmental resources requires coordinated effort by the six partner governments and close cooperation with the Basin community. The MDBC actively supports a government–community partnership and relies on it to implement effective natural resources planning and management in the Basin. This cooperative approach brings to participants and end-users the benefit of shared concerns and expertise, and jointly developed and integrated solutions; and avoids duplication of effort.
In August 2000, the MDBC approved its corporate plan for the period 2000/01 to 2002/03. This annual report addresses the performance indicators agreed in the Corporate Plan against four output areas:

- Water Business—Chapter 3;
- Natural Resources Business—Chapter 4;
- Partner Relations—Chapter 5; and
- Business Administration—Chapter 6.

Through its corporate plan, the MDBC also agreed to adopt the values (see box, p. 8) it developed with the CAC to guide the way it operates.

The Murray-Darling Basin Commission Office (MDBC Office) provides the technical, policy formulation, secretariat and administrative services required to administer the Agreement and help deliver MDBC outputs. It is responsible for coordinating the implementation of the range of strategies and activities that operate within the agreed policy framework. The MDBC Office includes River Murray Water (RMW), the management unit responsible for the business of managing water (see Chapter 3).

### 1.4 Policy and program implementation to achieve outputs

Policies and programs of the Ministerial Council and MDBC are implemented by the MDBC Chief Executive and by commissioners representing the partner governments. In 2002/03 the MDBC’s programs were supported by funds from the contracting governments in proportions approved by the Ministerial Council, as shown in Tables 14, 15 and 16 (see Chapter 6, pp. 112–113). Funds are allocated to States for agreed Initiative programs in accordance with estimates approved by the Ministerial Council.

**River Murray Water**

Under its operating authority, the MDBC has delegated appropriate powers for water and asset management functions to the General Manager of River Murray Water. In exercising the delegated powers, the General Manager must consult with the RMW Advisory Board particularly in relation to policy matters.

**Natural Resources Business, Partner Relations and Business Administration**

The MDBC has delegated to the Chief Executive those expenditure, employment and contracting powers necessary to operate the MDBC Office. Commissioners representing the partner governments have delegated powers from the MDBC to approve expenditure of designated funds consistent with the Agreement.
MURRAY-DARLING BASIN COMMISSION VALUES STATEMENT

We will manage and conduct our business in a highly professional and ethical manner, and according to the values jointly agreed with the Community Advisory Committee. These values require particular behaviours that will cement our relationships with our stakeholders and the wider community, and will underlie all decisions, actions and relationships we enter into. We will promote the values so that all people and organisations that have dealings with the MDBC know what to expect from us and what we expect from them.

Courage

We will take a visionary approach, provide leadership and be prepared to make difficult decisions.

Inclusiveness

We will build relationships based on trust and sharing, considering the needs of future generations, and working together in a true partnership. We will engage all partners, ensuring that partners have the capacity to be fully engaged.

Commitment

We will act with passion and decisiveness, taking the long-term view and aiming for stability in our decisions. We will take a Basin perspective and a non-partisan approach to managing the Basin.

Respect

We will tolerate different views; act with integrity, openness and honesty; be fair and credible; use resources equitably; respect the environment; share knowledge and information; respect each other and acknowledge the reality of each other's situation.

Flexibility

We will accept reform where it is needed, and be willing to change and continuously improve our actions.

Practicability

We will choose practical, long-term outcomes, select viable solutions to achieve these outcomes and ensure that all partners have the capacity to play their agreed part.

Mutual obligation

We will share responsibility and accountability. We will act responsibly, with fairness and justice. We will support each other through necessary change.
The Community Advisory Committee of the Murray-Darling Basin Ministerial Council is the peak community body established under the Murray-Darling Basin Agreement. The CAC provides advice to the Ministerial Council and the MDBC on issues related to the sustainable management of the Basin’s natural resources. During 2002/03, the CAC focused on the key issues of ICM and environmental flows.
The Community Advisory Committee (CAC) continues to provide independent advice on natural resources management in the Basin to the Ministerial Council and to participate actively in MDBC processes. In 2002/03 the CAC assisted the launch of the Murray-Darling Basin Leadership Program, and provided key advice on the implementation of the Integrated Catchment Management Policy (ICM Policy) and The Living Murray initiative.

2.1 Strategic issues

The CAC work plan for 2002/03 was endorsed by the Ministerial Council on 12 April 2002 and a revised version better reflecting the CAC’s key tasks was presented and endorsed on 1 November 2002. The work plan provides focus for the development of the CAC’s advice to the Ministerial Council. Strategic issues for the year included continuing the development and adoption of the ICM approach, the further development of The Living Murray initiative and the launch of the inaugural Murray-Darling Basin Leadership Program. The CAC further identified the need to provide specific advice on natural resources management issues faced by Indigenous peoples in the Basin. The CAC also continued to provide advice on salinity, terrestrial biodiversity and other natural resources management issues.

Integrated catchment management

The launch of the policy document, *Integrated Catchment Management in the Murray-Darling Basin 2001-2010* (ICM Policy), in 2001 established a long-term partnership between the CAC and the Ministerial Council. The CAC has adopted the values and principles in the ICM Policy to guide the way it operates. It supports the ICM approach as the basis for all natural resources management activities across the Basin.

In order to continually improve the approach, the ICM Policy states that the CAC and Ministerial Council will jointly review the progress of the ICM approach against agreed performance measures. The CAC invested considerable effort into the development of draft performance measures. These performance measures were adopted in principle by the Ministerial Council in May 2003 to establish the basis for the first joint review of the ICM approach in March 2004.

The performance measures examine seven key areas to determine whether or not processes to implement the ICM approach have been set up and how effectively they have worked. These areas are: knowledge, governance, institutional arrangements, investment, engagement, capacity building and target setting.
CAC WORK PLAN 2002/03 (REVISED)

Priority issues for 2002/03 which the CAC could provide advice to the Commission and Council include the following.

1. Implementation of the ICM Policy:
   (a) the adequacy of arrangements to support implementation, including:
      (i) the extent to which the roles and responsibilities of all relevant stakeholders are clearly defined and understood;
      (ii) the support needed to ensure catchment management organisations and government bodies have the capacity to implement the policy;
   (b) the most appropriate mechanisms to engage all relevant stakeholders in the development of strategies and targets, and the support needed by communities to become engaged;
   (c) the most appropriate mechanisms to ensure investment is targeted at priority actions.

2. Environmental Flows (The Living Murray):
   (a) how best to engage with the community – what would be the most respectful, meaningful and efficient process. Specific issues include:
      (i) availability of reliable information and data;
      (ii) allowing sufficient time to ensure the community is informed and engaged while acknowledging the urgent need for action;
      (iii) appropriate involvement of indigenous peoples;
   (b) what are the trade-offs – what are givens as far as the community is concerned and what is negotiable. Specific areas include:
      (i) methods/tools, locations, timing for securing water, and associated compensation issues;
      (ii) institutional impediments.

3. Basin Salinity Management:
   (a) progress in implementation of the Basin Salinity Management Strategy (BSMS). Specific issues include:
      (i) how best to encourage catchment management organisations to move from aspirational goal setting to more targeted and strategic on-ground actions;
      (ii) the knowledge, decision tools and capacity building support required by communities to address salinity, including setting salinity targets and managing trade-offs;
   (b) ways to improve linkages between the BSMS and the delivery of the National Action Plan for Salinity and Water Quality in the Basin.
The Living Murray

There was significant development in the Environmental Flows and Water Quality Objectives Project in 2002/03 following the launch of *The Living Murray – a discussion paper on restoring the health of the River Murray* in July 2002 and the commencement of a program of community engagement. The refocus on an integrated package of activities addressing ecological, economic, social and cultural outcomes is now known as The Living Murray initiative.

The Living Murray has been a major focus for the development of CAC policy advice to the Ministerial Council throughout 2002/03, with particular emphasis on:

- addressing issues in the community engagement process;
- developing principles and criteria to guide planning and implementation; and
- developing system-wide ecological objectives for a healthy, working river system.

The Ministerial Council launched The Living Murray in April 2002 with a very strong commitment to engage the community over... *community values, knowledge and aspirations for scientific and technical knowledge in developing, determining and negotiating options for the recovery of water for the environment*. Throughout the year there was considerable confusion and concern over The Living Murray process and how it might impact on industries and rural communities, particularly in the major irrigation districts. In response to these concerns, the CAC hosted a community forum on 12 April 2003 and developed a statement from the community (Melbourne Communiqué) that was delivered to the Ministerial Council. The key points from the Melbourne Communiqué were that:

- the process of engagement is as critical as the outcome;
- equity involves a balanced sharing of costs and benefits of change;
- accessible and credible information must underpin community discussions and policy decisions; and
- change must be underpinned by effective institutional arrangements and adequate resources.

The CAC has since been instrumental in establishing an independent evaluation of the community engagement process to be delivered in late 2003.
During 2001/02, the CAC worked with the MDBC to establish a program to develop the leadership potential of people committed to the sustainable development and management of the Basin. The pilot program for the Murray-Darling Basin Leadership Program was launched in July 2002 with the first program commencing in November. The Ministerial Council approved a further two years of funding for the program at its meeting in May 2003.

Fifteen people working across the Basin were selected to participate in the pilot program. This program included activities aimed to develop personal leadership qualities and styles as well as team building and networking skills.

The graduates from the pilot program have committed to working to achieve a sustainable future for the Basin and this will be supported by a graduate network program managed by the CAC Secretariat.

Indigenous involvement in natural resources management (NRM)

In recognition of the need to provide both specific advice on the Indigenous Scoping Study being developed by the MDBC and to bring forward general issues and perspectives from Indigenous people in the Basin, the CAC formed the Indigenous Involvement in the NRM subcommittee. Two CAC members have been appointed to attend Murray Darling Rivers Indigenous Nations meetings.

Key issues for consideration in 2002/03 have been:

- the scoping study conducted as a precursor to the development of an Indigenous Action Plan;
- finalisation of a memorandum of understanding with the Murray Darling Rivers Indigenous Nations; and
- Indigenous input to The Living Murray initiative.

Seventeen CAC members and three staff participated in a one-day cultural awareness workshop conducted by Gundabooka Consultancy Pty Ltd.
2.2 Communication

Newscan

The CAC has been involved in the production of Newscan since its inception in 1989, with collaboration from the MDBC’s Communication Unit since 2002. Newscan is a Basin-wide newspaper clipping service that provides wide-ranging perspectives on natural resources management issues across the Basin.

In April 2003, the CAC handed this task over entirely to the MDBC in order to focus its resources on providing increased support to members.

Website

The CAC continues to have its own page on the MDBC website with information about its membership, terms of reference and key areas of work. The website is located at <www.mdbc.gov.au>.

The CAC has set a goal to achieve more effective communication between members and with the wider community for 2003/04.

2.3 Performance report

CAC participation

The CAC held three meetings in 2002/03 in addition to joint meetings with both the Ministerial Council and the MDBC, and ten meetings across five of the CAC’s active subcommittees—Water, ICM, Capacity Building, Native Fish Strategy and Indigenous Involvement in NRM. Four Executive Team meetings/teleconferences were also held. The CAC Chairman attended the Ministerial Council meetings in November 2002 and May 2003, as well as five MDBC meetings throughout the year.

CAC members continue to be very active in MDBC committees and participated on:

- the Water Policy, ICM Policy and Finance committees;
- project boards including The Living Murray, Interstate Water Trade, Terrestrial Biodiversity, Vegetation Bank and Sustainable Rivers Audit;
- working groups including the Community Reference Group for The Living Murray, Basin Salinity Management Strategy Implementation Working Group, Sustainable Rivers Audit Taskforce and Groundwater Technical Reference Group; and
- program knowledge committees for ICM, Landscapes and Industries, and Rivers.
CAC review

During much of 2002/03, an independent review of the CAC was being conducted. The CAC review investigated the effectiveness of the CAC and the best terms of reference, structure and support for the CAC to meet the natural resources management agenda for the future.

The review panel’s report was delivered to the Ministerial Council on 9 May 2003 for consideration. It found that there was considerable confusion over the role of the CAC and that few referrals have been put to the CAC from the Ministerial Council or the MDBC seeking specific community input. The review panel also found that some sectors of the community feel excluded.

Table 1. CAC performance measures.

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>Measure</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM 1 CAC Advice to the Ministerial Council</td>
<td>CAC advice register</td>
<td>Of 30 recommendations to the Ministerial Council from the CAC, 28 were adopted.</td>
</tr>
<tr>
<td>The percentage of CAC advice that is adopted by the Ministerial Council</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM 2 CAC Member Contributions</td>
<td>membership lists reports</td>
<td>Of 28 CAC members, 16 sit on CAC subcommittees and 15 on MDBC committees and working groups</td>
</tr>
<tr>
<td>The percentage of members active on CAC subcommittees and MDBC working groups and reports the number of reports received</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall 22 members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>From 32 committee and working group meetings (not all attended by CAC members), 8 reports were submitted</td>
</tr>
<tr>
<td>PM 3 Capacity Building and Engagement</td>
<td>attendance records</td>
<td>Cultural Awareness Workshop: 1 activity (2 sessions) 59% members attended</td>
</tr>
<tr>
<td>Participation in capacity-building activities provided for CAC members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM 4 Secretariat Performance</td>
<td>CAC member questionnaire</td>
<td>From 16 responses, all members considered Secretariat performance in the range from adequate to very good (scale from very poor to very good)</td>
</tr>
<tr>
<td>The adequacy and timeliness of agenda paper preparation for CAC meetings</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* A single recommendation was rejected on the basis that additional information was required. This recommendation was subsequently agreed at the next meeting following further investigation between the meetings.
from the MDBC’s decision-making processes. Despite this, it found that the CAC is active in bringing forward advice to the MDBC and Ministerial Council.

Subsequent discussions by members of the Ministerial Council have worked towards finalising a revised terms of reference and CAC structure for consideration at the Ministerial Council’s meeting in November 2003.
Output

Water for consumptive and environmental uses delivered to New South Wales, Victoria and South Australia consistent with their entitlements under the Murray-Darling Basin Agreement, and with environmental qualities of the River Murray system.
3.1 Strategic directions

In 1996, in response to the 1994 water reform principles of the Council of Australian Governments (COAG), the Ministerial Council established a water business titled River Murray Water (RMW). The distinct nature of RMW clearly delineates the service delivery functions of the MDBC from its resources management and policy functions.

The establishment of RMW was achieved within the terms of the existing Agreement, thus retaining the essential Basin-wide integration of values that are at the heart of the Initiative. Achieving this appropriate distinction between service delivery and resource management functions in order to clarify roles and responsibilities, while preserving the commitment to joint action within the context of Basin-wide values, continues to be a critical objective.

The major strategic directions followed by RMW during 2002/03 were planned to take account of changing community standards in the management of water conservation and salinity mitigation works, and to ensure the sustainable management of assets.

Within the terms of the existing Agreement, RMW has established its corporate identity and achieved:

- a revised cost-sharing arrangement based on the principles of a two-part, service-based tariff that is a reasonable surrogate for full cost-recovery pricing; and
- recognition by the National Competition Council that the achievements have, in the circumstances, satisfied the relevant COAG principles.

In 2002/03 the Ministerial Council approved, in principle, amendments to the Agreement to enable:

- establishment and management of renewals annuities for replacing of assets and also for major cyclic maintenance;
- cost-sharing arrangements between governments to be varied from time to time based on price for service principles;
- re-allocation of responsibility for River Murray structures from one constructing authority to another, subject to agreement by the Ministerial Council, and
- amendment by the Ministerial Council, from time to time, of expenditure approval thresholds.

These proposed amendments have been referred to governments for consideration and implementation. As a package of amendments, they will, if adopted, effectively complete the asset management and financial reforms recommended by COAG in 1994.
While managing the River Murray system in accordance with the principles of the Agreement, RMW continues to focus on opportunities to identify and implement measures to improve environmental outcomes. To this end, it is proposed that above-budget income arising from the hydro-electric generation in 2002/03 be made available to the MDBC for environmental objectives. This above-budget income arose as a result of the high level of releases from Dartmouth and Hume storages due to severe drought conditions. This specific contribution is an example of an environmental dividend arising from the sustainable management of RMW assets.

### 3.2 Water resources management

The water resources of the River Murray system (see Figure 2) are used for a wide range of beneficial purposes. In addition to its inherent natural value to riverine, floodplain and estuarine ecosystems, it is used for irrigation, industrial and domestic water supplies, navigation, recreation, and generation of hydro-electricity. RMW manages the river system to ensure that the available water is documented in the water accounts and distributed to South Australia, Victoria and New South Wales in accordance with the Agreement.

**Figure 2.** Water resources of the River Murray system.
RMW undertakes the tasks of sharing and supplying water through:

- **assessing** future availability of water;
- **accounting** for actual use of water; and
- **regulating** river flows to meet environmental and user needs.

Management of the River Murray system is based on a system of continuous water accounts. Assessments of the future availability of water are based on the status of these accounts and estimates of future system inflows, including inflows to the River Murray resulting from the operation of the Snowy Mountains Scheme. RMW uses these assessments to advise the States of the shares of water available for the remainder of the irrigation season and the following season. The States then announce water allocations based on these shares and their own plans for water management.

The severe drought of the 2002/03 season resulted in record low irrigation allocations in the River Murray system. Record high evaporation and transmission losses occurred during winter/spring 2002 as a result of the warmest winter/spring period for over 50 years. These losses exceeded the allowances used to plan River Murray system operations, placing the operation of the system under extreme pressure until mid–late summer when losses were reduced. This pressure was exacerbated by a shift in Snowy–Murray releases to late in the season.

**Water availability**

Prior to the 2002/03 season, conditions in the River Murray system, including the lower Darling, had been very dry. Total inflows to the system (including the headwaters of the upper Murray, and inflows from all downstream tributaries including inflows from the Darling River to Menindee Lakes, but excluding Snowy Mountains Scheme releases) had a probability of exceedance of 90% for the 2001/02 season. At the end of June 2002, River Murray system storages contained 4563 GL, or 48% of capacity. However, Menindee Lakes were under New South Wales control, with a storage of just 338 GL. Available active storage in Dartmouth Reservoir, Hume Reservoir and Lake Victoria was 4015 GL, or 54% of available active storage capacity.

Following a dry autumn, winter and spring 2002 were also very dry. In 2002/03, total River Murray system inflows for the period June–May were the fourth lowest since 1890. Over the two-year 2001/03 period, total River Murray system inflows were the lowest on record (see Tables 2 & 3).
Table 2. Lowest one-year inflow (June–May).

<table>
<thead>
<tr>
<th>Season</th>
<th>Total inflow to River Murray system (excluding the Snowy Mountains Scheme) (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1902/03</td>
<td>1 910</td>
</tr>
<tr>
<td>1914/15</td>
<td>1 790</td>
</tr>
<tr>
<td>1944/45</td>
<td>2 250</td>
</tr>
<tr>
<td>1982/83</td>
<td>1 980</td>
</tr>
<tr>
<td>2002/03</td>
<td>2 220</td>
</tr>
</tbody>
</table>

Table 3. Lowest inflows over two years (June–May).

<table>
<thead>
<tr>
<th>Season</th>
<th>Total inflow to River Murray system (excluding the Snowy Mountains Scheme) (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901–03</td>
<td>7 250</td>
</tr>
<tr>
<td>1913–15</td>
<td>7 430</td>
</tr>
<tr>
<td>1943–45</td>
<td>7 610</td>
</tr>
<tr>
<td>1944–46</td>
<td>7 190</td>
</tr>
<tr>
<td>2001–03</td>
<td>6 590</td>
</tr>
</tbody>
</table>

Table 4. Water Accounts for New South Wales and Victoria 2002/03 (GL).

<table>
<thead>
<tr>
<th>Storage location</th>
<th>Storage at 30 June 2002</th>
<th>Storage at 30 June 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSW</td>
<td>Vic</td>
</tr>
<tr>
<td>Dartmouth Reservoir</td>
<td>1 316</td>
<td>1 953</td>
</tr>
<tr>
<td>Hume Reservoir</td>
<td>0</td>
<td>563</td>
</tr>
<tr>
<td>Menindee Lakes *</td>
<td>[105]</td>
<td>[290]</td>
</tr>
<tr>
<td>Lake Victoria</td>
<td>139</td>
<td>253</td>
</tr>
</tbody>
</table>

| Total            | 1 560    | 3 059    | 4 619    | 1 499          | 672        | 1 398    | 2 070    | 726            |

Notes:
- Accounts are based on operational data (rounded to nearest GL).
- Data relates to gross storage.
- The ‘out-of-balance’ figure reflects the volume of stored water accounted to Victoria, minus the volume of stored water accounted to New South Wales.
- * Menindee Lakes has been in New South Wales control since mid March 2002, at which time the out-of-balance in shares was 185 GL. The individual shares for Victoria and New South Wales are assumed to be the values shown in brackets [thus] only for the purpose of preserving the out-of-balance of 185 GL until Menindee Lakes next returns to MDB control when storage next exceeds 640 GL.

River Murray Water
The extremely low inflows, combined with the use of much of the reserves from the previous season to supply demands during 2002/03, contributed to reserves at the end of June 2003 being the lowest since 1979 (at 24% of available active storage capacity). Water availability for each State at the beginning and end of the 2002/03 season is shown below.

**State irrigation allocations**

Irrigation allocations for the opening of the 2002/03 irrigation season were made on 15 August 2002 by both New South Wales and Victoria. Victoria’s initial irrigation allocation for the major River Murray gravity diversion districts was announced as 100% Water Right plus 29% ‘Sales’ water. The allocation of ‘Sales’ water was possible due to:

- Victoria’s combining available reserves carried over from previous seasons with their policy of forward planning over two years based on inflows of 75% probability of exceedance for the current season; followed by
- historical minimum inflows in the following season.

As inflows during 2002/03 were drier than 75% probability of exceedance, there was no scope for further increases in Victoria’s irrigation allocations during 2002/03.

New South Wales’ opening irrigation allocation for the 2002/03 season was low as a result of low reserves caused by higher use during previous seasons. On 15 August 2002, an allocation of 10% General Security was announced along with 100% High Security water. As a result of the extremely low inflows, combined with higher than expected transmission and evaporation losses, the New South Wales General Security allocation remained at 10% for the remainder of the 2002/03 season. New South Wales High Security licence holders had access to 100% of High Security allocations for the entire 2002/03 season.

Both Victoria’s and New South Wales’ irrigation allocations for 2002/03 were the lowest since the River Murray system storage was augmented by the commissioning of Dartmouth Reservoir in 1979. In Victoria’s case, Murray irrigation allocations were lower in 1967/68, prior to the completion of the Snowy Mountains Scheme, when the Victorian Murray allocation of 100% Water Right plus 10% Sales was augmented by releases from the Goulburn system to the Murray.

In New South Wales, the 2002/03 irrigation allocation of 10% General Security was the lowest on record. While modelling of historical inflows for the current level of irrigation development shows that since 1890 there would have been several years where New South Wales General Security allocations would be zero, these conditions occurred prior to the expansion in irrigation demands during the 1970s and 1980s in the New South Wales.
Murray Riverina. Hence, New South Wales irrigators had never before experienced conditions similar to the 2002/03 season.

In July 2002, reserves held by Victoria and New South Wales were sufficient to supply South Australia with its full entitlement flow of 1850 GL for the season. South Australian water allocations were not restricted during 2002/03. By the end of June 2003, extremely low inflows and depleted reserves during 2002/03 led to predictions that South Australia’s entitlement for 2003/04 would be restricted unless median or wetter conditions occurred in winter/spring 2003.

**State irrigation diversions**

Dry conditions during autumn and winter 2002 led to relatively high demands for irrigation water from the major gravity diversion channels in both New South Wales and Victoria early in the 2002/03 irrigation season, despite the low allocations. In general, most irrigators used a relatively high proportion of their opening allocation to complete winter crops and to overcome the lack of winter/spring rainfall. Due to ongoing low inflows, irrigation water use then tapered off over the remainder of the season, and the typical late summer/autumn peak in diversions did not occur. In the New South Wales Murray Riverina, low allocations, combined with the early consumption of available water on winter crops, combined to reduce the planting of rice to a very small fraction of the previous season’s plantings.

**Figure 3. Irrigation diversions at major gravity diversion systems.**
While the pattern of diversions at major gravity diversion channels was very different to ‘normal’ usage patterns, the pattern of use was very similar to that which occurred in 1982/83. Figure 3 compares usage patterns at the major channel offtakes in 2002/03 to both 1982/83 and a ‘typical’ year.

In response to the record low allocation, Murray Irrigation Limited (MIL) negotiated an advance of 2003/04 minimum required release water from the Snowy Mountains Scheme. The MDBC agreed to this arrangement in September 2002, with the provision that the water would be accounted as fully New South Wales (with no impact on Victoria and South Australia’s water availability), and would be paid back in 2003/04, with an option to carry the debt forward to 2004/05 should New South Wales allocations in 2003/04 be less than 50% on 1 September 2003. In total, 134 GL in addition to the 2002/03 minimum required release was released by the Snowy Mountains Scheme to individual irrigators in MIL, with a further 4 GL released for non-MIL New South Wales irrigators late in the season.

Significantly, the MDBC advised New South Wales that due to the transfer capacity between Dartmouth and Hume Reservoir being fully used in supplying existing entitlements to New South Wales, Victoria and South Australia, and the forecast extremely low levels in Hume in late summer–early autumn, MIL irrigators would not be able to access the advance until it was delivered by the Snowy Mountains Scheme—forecast to occur in March and April 2003.

Access to MIL’s advance from the Snowy Mountains Scheme became available from early March 2003, as a result of slightly higher Hume storage than worst-case predictions. However, the MIL advance was not fully used by MIL irrigators, contributing to a higher than expected carryover of unused New South Wales Murray entitlement at the end of the 2002/03 season.

State diversions from the River Murray and lower Darling River are detailed in Table 5.

**Water trade**

Large volumes of water were temporarily traded within the River Murray system during this extremely dry season. The very low allocation levels in New South Wales resulted in high demand for traded water in this State.

RMW adjusted State water shares and deliveries to take account of permanent trade (see p. 74) and the large quantity of temporary trade during 2002/03. Total net adjustments made to water accounts were:

- Victoria to New South Wales 12.6 GL;
- South Australia to New South Wales 2.5 GL; and
- Victoria to South Australia 5.5 GL.
Table 5. Summary of State diversions (GL).

<table>
<thead>
<tr>
<th>Year</th>
<th>River Murray</th>
<th>Darling**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSW</td>
<td>Vic</td>
</tr>
<tr>
<td>1982/83</td>
<td>1 638</td>
<td>1 637</td>
</tr>
<tr>
<td>1983/84</td>
<td>1 765</td>
<td>1 318</td>
</tr>
<tr>
<td>1984/85</td>
<td>2 163</td>
<td>1 749</td>
</tr>
<tr>
<td>1985/86</td>
<td>1 939</td>
<td>1 580</td>
</tr>
<tr>
<td>1986/87</td>
<td>1 780</td>
<td>1 472</td>
</tr>
<tr>
<td>1987/88</td>
<td>2 104</td>
<td>1 845</td>
</tr>
<tr>
<td>1988/89</td>
<td>1 411</td>
<td>1 337</td>
</tr>
<tr>
<td>1989/90</td>
<td>2 068</td>
<td>1 651</td>
</tr>
<tr>
<td>1990/91</td>
<td>2 277</td>
<td>1 856</td>
</tr>
<tr>
<td>1991/92</td>
<td>2 600*</td>
<td>1 827</td>
</tr>
<tr>
<td>1992/93</td>
<td>1 589</td>
<td>1 147</td>
</tr>
<tr>
<td>1993/94</td>
<td>1 972</td>
<td>1 407</td>
</tr>
<tr>
<td>1994/95</td>
<td>2 123</td>
<td>1 990*</td>
</tr>
<tr>
<td>1995/96</td>
<td>1 904</td>
<td>1 742</td>
</tr>
<tr>
<td>1996/97</td>
<td>2 223</td>
<td>1 745</td>
</tr>
<tr>
<td>1997/98</td>
<td>1 863</td>
<td>1 696</td>
</tr>
<tr>
<td>1998/99</td>
<td>1 978</td>
<td>1 766</td>
</tr>
<tr>
<td>1999/00</td>
<td>1 212</td>
<td>1 540</td>
</tr>
<tr>
<td>2000/01</td>
<td>2 048</td>
<td>1 712</td>
</tr>
<tr>
<td>2001/02</td>
<td>2 113</td>
<td>1 916</td>
</tr>
</tbody>
</table>

2002/03#

|        | 879 | 1789 | 750 | 3418 | 107 |

+ Data are based upon the official MDBC record for the reporting requirements of implementation of the ‘Cap’ on diversions.

* Record high diversion.

** Includes releases from Cawndilla Outlet to the Great Darling Anabranch.

# Data presented for 2002/03 is preliminary and subject to confirmation.
Trade into the Victorian tributaries of the River Murray balanced with trades out resulting in zero balances in all Victorian valley accounts and, therefore, no water was called from these tributaries to supplement flow in the River Murray.

The position was quite different for the Murrumbidgee River system where the 54 GL overdraw of the account at the end of 2001/02 was paid back by some trade out of the Murrumbidgee plus a transfer of 40 GL, via the Snowy Mountains Scheme, from the Murray to the Murrumbidgee. A small balance of approximately 2 GL was available in the Murrumbidgee account. However RMW elected not to call on this in order to avoid exacerbating supply difficulties within the Murrumbidgee River system.

An email-based trade notification and accounting system was trialled late in the year and will be implemented for the 2003/04 season.

Flow to South Australia

South Australia received its full entitlement flow of 1850 GL in the 2002/03 season, although this was significantly lower than the median annual flow of 4900 GL. The total volume of flow at the South Australian border was the lowest since 1967/68.

The extended period of entitlement flow at the South Australian border contributed to water quality and access problems in the lower reaches of the River Murray downstream of Lock 1 (adjacent to Blanchetown). The lack of any additional dilution flow or unregulated flows from either upstream or from local inflows from the Mt Lofty Ranges throughout the year meant that Lake Alexandrina and Lake Albert could not be filled to normal targets in spring 2002. South Australia’s entitlement flow was consequently insufficient to offset high evaporation rates in the lower lakes, leading to the lowest lake levels seen since 1983 and high salinity levels reaching 4700 EC in the Goolwa channel and 1450 EC in Lake Albert by the end of June 2003.

By the end of June 2003, South Australia had experienced the longest period on record of regulated flows (a total of 26 months, commencing in May 2001) and the longest period in which the barrages have remained closed (19 months from the end of November 2001 to the end of June 2003, compared with a period of 17 months in the 1967/68 drought).

Operation of storages

Total MDBC storage at the beginning of July 2002 was about 4640 GL, or 48% of active storage capacity. This was the lowest opening storage since 1999, and by October 2002 storage was 4300 GL (45% of active capacity) which at that time was the lowest storage experienced since 1979.

Significantly, at the beginning of July 2002 most MDBC storage was in Dartmouth Reservoir. Hume Reservoir was very low as a result of dry
conditions throughout Autumn 2002. As a result, transfers from Dartmouth to Hume commenced on 5 June 2002, the earliest commencement of irrigation transfers from Dartmouth that has ever taken place, and the rate of transfer was progressively increased to 10 000 ML/day—the channel capacity of the Mitta Mitta River for regulated flows—by the end of August 2002.

Transfers from Hume to Lake Victoria commenced in late July 2003—the earliest start to Hume – Lake Victoria transfers that has ever occurred. To cater for extreme dry conditions, planning incorporated making later transfers at rates higher than the channel capacity for regulated flows through Barmah Choke, trading off the risk of higher losses caused by passing water through flood runners in Barmah Forest against the increased risk of spill from Lake Victoria. This compromise would not be needed if conditions were better than extremely dry. However, extremely dry conditions did occur and higher than expected transmission losses caused by record warm, dry conditions increased the transfer requirement (see below).

Despite the earliest ever commencement of transfers from Dartmouth to Hume, the outlook showed an increasing risk of critically low levels in Hume Reservoir by late summer/early autumn under minimum inflow conditions. Updated forecasts showed this risk consistently increasing throughout winter/spring 2002, as a result of record transmission losses along the mid-Murray exceeding previous ‘worst case’ allowances. In addition, Snowy Mountains Scheme releases to the Murray throughout Winter/Spring 2002 were very low, exacerbating the risk of critically low storage levels in Hume (see section on the Snowy Mountains Scheme, p. 28).

Record high transmission losses along the mid-Murray between Hume and Lake Victoria were caused by record high monthly average temperatures in the period July – September 2002, which was the warmest July – September period for over 50 years. Transfers from Hume Reservoir to Lake Victoria were also delayed in an effort to reduce the risk of spill from Lake Victoria should conditions subsequently turn wet. As no improvement in conditions occurred, transfers from Hume to Lake Victoria became necessary at rates in excess of channel capacity through the Barmah Choke in order to prevent Lake Victoria from also falling to critically low levels in late Summer/early Autumn 2003.

Additional transmission losses through Barmah–Millewa Forest were kept to a minimum by excluding the regulated transfers from the New South Wales (Millewa) side. However, the transmission nevertheless exacerbated already high losses by requiring use of flood runners to reach wetlands in Barmah Forest that the regulated flows normally would not reach.
Some relief from the high transmission losses occurred during summer 2002/03, possibly as a result of significant airborne pollution from dust and bushfire smoke reducing average temperatures in January and February. As a result, neither Hume nor Lake Victoria was drawn down to the critically low levels that had been earlier forecast and transfers were able to be reduced. Hume storage reached 156 GL (5% capacity) on 25 January 2003, the lowest level in Hume Reservoir since 1968 (prior to the completion of Dartmouth), when it reached 28 GL.

Transfers from Dartmouth to Hume for the 2002/03 season totalled 2509 GL, the highest total since the 1982/83 drought. Dartmouth storage was drawn down to 1129 GL (29% capacity) on 11 May 2003, the lowest level in Dartmouth since late 1983.

Lake Victoria storage peaked at 570 GL in early January 2003, and was drawn down to 253 GL by the end of April. The release of additional water to satisfy cultural heritage requirements at Lake Victoria was not required. While the Lake Victoria Operating Strategy provides for the storage of water above normal targets when upstream reserves are low, Lake Victoria was required to be drawn down below these targets as a result of normal operations.

Storage in Menindee Lakes at the beginning of July 2002 was 395 GL (21% capacity), and the lakes remained in New South Wales control as required by the Agreement. This provision allows New South Wales to manage a ‘drought reserve’ to meet the needs for irrigation, stock and domestic and town water supply (including Broken Hill) in the lower Darling River and Darling Anabranch. Inflows to Menindee Lakes remained extremely low during 2002/03, and by the end of June 2003 storage volume was critically low at 70 GL, the lowest storage volume in Menindee Lakes since the construction of regulating structures at the lakes in the early 1960s.

By the end of June 2003, the MDBC’s active reserve storage was approximately 1790 GL (24% active storage capacity), mainly in Dartmouth Reservoir. This was the lowest end-of-season storage since 1979.

Storage behaviour resulting from RMW’s operation of the MDBC’s four major storages is shown in Figure 4.

The Snowy Mountains Scheme

Storage in the Snowy Mountains Scheme was approximately 60% of active capacity at 1 May 2002. The Snowy Mountains Council approved the release of up to 1624 GL from Murray 1 Power Station for the twelve-month period 1 May 2002 to 30 April 2003. This was significantly above the ‘minimum notification’ release volume of 1062 GL for the 12 months to the end of April.
The approved release was made up of:

- 1062 GL minimum notification release;
- an extra 13 GL due to under-delivery in 2001/02; and
- 549 GL underdraw that became available at 1 May 2002.

The actual release from Murray 1 Power Station for the 12 months to 30 April 2003 was 1213 GL. It was made up of:

- a minimum notification release volume of 1062 GL;
- an extra 13 GL in lieu of the operational under-delivery in 2001/02; and
- an extra 138 GL as an advance delivery for New South Wales irrigators from the 2003/04 season.

In September 2002, the MDBC received a request from New South Wales for an advance in release from the Snowy Mountains Scheme of up to 75 GL to supplement water availability to some New South Wales irrigators. This arrangement was approved by the MDBC in early October 2002, with appropriate water accounting arrangements put in place to prepare for payback of the advance in a subsequent water year. In mid-November 2002, the MDBC approved an increase in advance to a volume of up to 160 GL to be underwritten by New South Wales to ensure no future impact on South Australia or Victoria. The final volume of advance negotiated between New South Wales’ irrigators, the former Department of Land and Water Conservation (now Department of Sustainable Natural Resources), and Snowy Hydro Limited was 138 GL.

**Figure 4.** Storage behaviours resulting from RMW’s operation of the MDBC’s four major storages.
Despite the advance in release from the Snowy Mountains Scheme to the Murray in the 2002/03 water year, the release from Murray 1 Power Station was significantly less than the progressive minimum notification throughout most of the water year. The pattern of release was below the lower bound pattern of release derived to assess the impacts of corporatisation of the scheme. This added to difficulties in operating Hume Reservoir as there was a prospect of extremely low storage levels in late Summer of 2002/03 arising from the drought conditions and this may have constrained rates of supply downstream if improvements in inflow conditions had not occurred in early 2003.

With the Snowy Mountains Scheme being corporatised on 28 June 2002, the 2002/03 water year was the first year of operation of the scheme under the new arrangements of licensing by the New South Wales Water Administration Ministerial Corporation. The annual operating plan for the scheme was prepared by Snowy Hydro Limited in consultation with water agencies of New South Wales and Victoria, together with RMW.

Environmental report

River flows

Following relatively dry conditions in 2001/02, the very dry conditions of 2002/03 provided few opportunities for environmental flows. No spills of major River Murray system water storages occurred during 2002/03.

As a result of the lack of natural spring ‘freshes’, the Barmah–Millewa Forest Allocation was not used, and the 100 GL annual allocation was credited and carried over for use in a future season. However, the decision to delay Hume to Lake Victoria transfers (see above) until such time as they were needed at a rate exceeding channel capacity for regulated flows at the Barmah Choke resulted in some unusual benefits in Barmah Forest. These transfers were passed through Barmah Forest in preference to Millewa Forest in consultation with forest management authorities from both States. This effectively improved the efficiency of transfers and also increased environmental benefits in Barmah Forest. Transfers were passed through flood runners and wetlands in Barmah Forest from late July until mid-December, resulting in watering of wetlands to a greater extent than that which would have occurred under natural conditions. The flows were of a sufficient duration to allow breeding of ibis and royal spoonbill—a rare and threatened species in Victoria.

Inflows to the River Murray from both the Goulburn and Murrumbidgee Rivers were also very low and were generally confined to low regulated flow rates. On the Darling River upstream of Menindee Lakes, flows remained extremely low after October 2001. A very small ‘flush’ of water was received in April 2003. This small inflow mobilised salt that had
accumulated in pools and on the banks of the Darling River upstream of Menindee Lakes. Most of the reserves remaining in Menindee Lakes were contained in Lake Wetherell, which increased from a salinity level of about 1800 EC to near 4000 EC as a result of the high salt load contained in the small ‘flush’. However, salinity in the lake fell to between 500 and 1000 EC by the end of June.

Extended drought conditions caused continued stress to river red gum communities downstream of Barmah–Millewa. During 2002/03, reports emerged of widespread decline of river red gum communities downstream of Euston.

**Water quality**

The severe bushfires of early 2003 burnt approximately 50% of the Hume Reservoir catchment, including some 95% of the Dartmouth Reservoir catchment. The upper catchments of the Kiewa and Ovens Rivers were also severely fire affected with approximately 20% of each catchment burnt.

A potential existed over the remainder of the year for significant impacts on in-stream and reservoir water quality should heavy rainfall result in large quantities of ash and sediment being washed from unprotected soils. Some rainfall did result in short-term declines in water quality in the upper Ovens and Mitta Mitta River catchments, however, these were relatively minor due to the persistent dry conditions.

The relevant State agencies in New South Wales and Victoria instituted appropriate monitoring, rehabilitation and research activities to gauge the impacts of the fires on water quality, long-term yield and river ecosystems.

In early June, water in Dartmouth Reservoir ‘turned over’ or de-stratified bringing water from the lower levels to the surface after a period of low air temperatures and strong winds. This resulted in a short period of reduced water quality at the surface and in the releases made at that time.

Hume Reservoir suffered persistent high alert levels of potentially toxic blue–green algae between January and May. The high alert levels, coupled with the extremely low storage levels in Hume Reservoir, caused local water supply authorities to take steps to ensure adequate drinking water supplies.

Algal alerts in the Edward/Wakool system and the River Murray between Corowa and Wentworth were generally in the medium alert level range with some reaches, particularly Yarrawonga to Echuca recording high alert levels for extended periods in autumn.

Alert levels in the area were generally lower than those in 2001/02. They remained mostly within the medium alert range. Medium to high alert
levels of blue–green algae were recorded in the lower Darling River and these were consistent with the very low flows this season. River Murray algal levels in South Australia were consistently low except for medium and high alert readings of non-toxic species in the lower lakes and Coorong.

Salinity levels in the main stem of the River Murray were generally very low for much of the year. The transfer of high quality water from Dartmouth and Hume reservoirs, coupled with low inflows and drainage returns due to the extremely dry conditions, resulted in some of the lowest salinity and turbidity readings observed. The river salinity at Morgan averaged 340 EC in February which is approximately 280 EC below the average of about 620 EC observed over the last 20 years.

Salinity levels in parts of the lower lakes, however, were high, rising from about 1200 to 2000 EC by the end of summer due to the low inflows and high evaporation rates.

A minor inflow to Menindee Lakes in autumn mobilised salt that had previously accumulated on the dry bed of the Darling River upstream. This more saline water was stored in Lake Wetherell, raising its salinity to about 4000 EC before subsequently falling to be in the range 500 to 1000 EC by the end of June.

**Murray Mouth**

By early July 2002 the barrages at the Murray Mouth had been closed for seven months. Significant volumes of sand had accumulated inside the mouth and tidal flows into and out of the Goolwa and Taupitchere channels were severely dampened. With persisting drought conditions in the upper Murray catchment, there was a very real prospect that there would be no flow of freshwater to the sea for at least another 12 months.

Freshwater flows to the sea remove the sand that is brought into the mouth area by the ocean and tidal processes. Increasing consumptive use of water upstream for irrigation over the past 70 years has progressively reduced the amounts of water flowing to the sea. Today the median annual flow to the sea is only 27% of the ‘natural’ flow to the sea.

The volume of sand accumulated within the mouth area is estimated to be in excess of 2 million cubic metres.

The Murray Mouth had closed once previously in 1981. On that occasion it was reopened three months later by excavating a large channel across the beach and breaching the channel at the same time as the arrival of significant flood flows. Without such large flows it is likely that there would be insufficient scouring of sand to maintain a connection to the sea for a sustained period.

In July 2002, faced with the prospect of the mouth closing before summer and little prospect of significant flows to support an intervention program
to reopen a closed mouth, the Murray Mouth Advisory Committee recommended to the MDBC that a dredging program be implemented as soon as practicable. The approvals process involved referrals to gain consents from a number of agencies including:

- Environment Australia;
- National Parks and Wildlife Service SA;
- Environment Protection Authority SA;
- Coasts Protection Board;
- Crown Law (SA) for Native Title;
- Alexandrina Council; and
- Ngarrindjeri Community.

On 9 October 2002 a dredge commenced excavation in the Goolwa Channel with sand being discharged onto the beach of Sir Richard Peninsula, over 1 km from the mouth. Tidal processes effectively redistribute the sand along the beach.

The dredge operated seven days per week, 24 hours per day with stoppages only occurring for mechanical servicing and repair. By early December 2002 the dredge had excavated a 25 to 30 m wide channel from the Goolwa Channel to the sea. The breakthrough of this first channel resulted in measurable improvement in tidal fluctuations in the Goolwa Channel. The dredge then proceeded to excavate a channel from the mouth towards the Tauwitchere Channel.

The first half of 2003 was very much a battle against incoming sand and at times, particularly due to individual storm events, more sand was being brought into the mouth than was being removed. Nevertheless connectivity was maintained between the Coorong and the sea during the summer months. The high water levels that had inundated the mudflats, that are important feeding grounds for thousands of migratory birds, had been relieved.

In mid-February, a decision was taken by the Murray Mouth Advisory Committee to focus on keeping the mouth open through winter. To achieve this, the dredging focused on the Goolwa channel. By late April, the entrance to the Goolwa Channel was partially blocked by sand bars and the mouth had silted to the point that it was only 20 m wide and less than 1 m deep at low tide.

Clearly, while the existing program had managed to keep the mouth open for one summer, more extensive effort was needed to improve the chances of keeping the mouth open for a second summer in 2003/04.
At its meeting on 9 May 2003, the Ministerial Council supported an expansion of the current sand-pumping project to ensure that:

- the River Murray Mouth is kept open over the next 12 months; and
- a channel is excavated from the river mouth to the Coorong before summer 2003/04 to protect the health of the Coorong during next summer.

To achieve this, a second dredge was mobilised during June 2003.

It is apparent that:

- dredging will need to continue until such time as there is significant flow through the barrages to the sea (to scour large volumes of sand); and
- dredging will be required in the future whenever there are extended periods of low or no flow to the sea.

The Murray Mouth Advisory Committee has also developed contingency plans to re-open a closed mouth. The success of such an operation, if it were ever needed, would very much depend on availability of flood flows to scour large volumes of sand once initial breakthrough is achieved.

A morphological model of the mouth has also been developed for the MDBC by consultants CUBM Oceanics and Lawson and Treloar. By June 2003 the models had been tested and calibrated, and demonstrated to key stakeholders. The models have been used to provide guidance for the dredging program particularly relating to location and cross-sectional dimensions of proposed channels.

The model will be used to develop enhanced operating procedures for the barrages to ensure that barrages are operated in the future to maximise scour of sand, minimise sand ingress and enhance the health of the Coorong generally.

**The Living Murray**

RMW staff assisted The Living Murray initiative by:

- providing modelling assistance for the development of information for the three reference points (350 GL, 750 GL and 1500 GL) for the recovery of water for the environment of the River Murray system;
- assisting the regional evaluation process for identifying and evaluating environmental and social needs on a localised basis along the River Murray system;
- assisting with the development of proposals for structural and operational opportunities for improving the environmental values of the River Murray system (‘making the most of what we have’); and
• assisting with the development of the River Murray Environmental Manager function.

RMW will continue to be closely involved with these developments over the coming years.

River management activities

Hume–Yarrawonga Waterway Management Plan

During 2002/03, works continued under the 2002 river management plan for the Hume to Yarrawonga reach of the River Murray. The river management plan aims to balance water conveyance, economic production and environmental objectives for the reach. The plan has been developed in consultation with the Hume to Yarrawonga Advisory Committee representing agencies from each State together with local landholder interests, local government and wider community representatives.

Implementation of the plan through the business plan of RMW is conducted in consultation with the advisory committee.

Physical works undertaken during 2002/03 included the Priority Reach Program, Whole of Reach Program and Land Management Review.

Priority Reach Program

During winter 2003, works on the priority reaches of Wodonga and Travellers creeks were completed, and were undertaken on a further 15 sites, including six bed-grade control structures in anabranch streams and nine bank control structures in the form of timber groynes. Works were also undertaken in Boiling Downs Creek and on the main stem of the River Murray. Structures were constructed using a total of 7400 timber piles. Where available, large woody debris was also placed to increase stream roughness and provide additional instream habitat. These sites will be revegetated with indigenous native species in 2003/04.

Work has also commenced on three new river reaches—Parlour Creek, Ryans Creek and Hume Reservoir to Ryans Creek (Rapsey’s Creek). Site inspections have been undertaken and works are planned for 2003/04.

Whole of Reach Program

The Whole of Reach Program included works at over 80 sites, including placing rock armouring and/or timber groynes at priority erosion sites, and riparian revegetation for medium- to long-term bank stability.
Land management review

The Hume to Yarrawonga Advisory Committee continued with its investigations into arrangements that might be implemented by the MDBC to obtain easements or other equivalent rights over land affected by high regulated flow. These investigations are also intended to provide detailed information and policy guidance for a possible extension to enable the regulation of environmental flows above river channel capacity in the future.

3.3 Asset management

The assets controlled and managed under the Agreement are investigated, designed, constructed, operated and maintained, for and on behalf of the MDBC, by three constructing authorities from New South Wales, Victoria and South Australia:

- Department of Land and Water Conservation (now Department of Sustainable Natural Resources) (including its operating agent—State Water);
- Goulburn-Murray Water; and
- South Australian Water Corporation.

RMW exercises the MDBC’s responsibilities in relation to management of the assets (a list is at Appendix G). Daily operation and maintenance of the structures is by a collective team from these three authorities totalling 120 staff. RMW values the dedicated service of this team and appreciates the commitment and pride that is evident in the stewardship of the assets.

The Senator Collings Trophy has been awarded annually for more than 50 years to the team looking after the asset judged to be the best maintained lock and weir. In 2002 the trophy was awarded to Peter Probert, Maurice Porter and Brenton Ebert at Lock and Weir 9 (Kulnine).

Since 1995, the investigation program has been dominated by Hume Reservoir. While work continued on a Phase 4 program at Hume, the rate of expenditure has slowed significantly. This has allowed remedial works to proceed at other assets including:

- Yarrawonga Weir (seismic upgrade);
- Mildura Weir (trestle replacement);
- Tauwitchere and Ewe Island barrages (OH&S upgrade);
- Locks and Weirs 1 to 10 (replacement of navigable passes); and
- Dartmouth Reservoir (scour protection works and safe access).
Hume Dam

Since April 1995, following a structural review of Hume Dam, the MDBC has been pursuing a program of upgrading the dam to contemporary standards. This program addresses:

- stability of the dam itself;
- the reliability of outlet works and spillway; and
- the capacity of the spillway under extreme floods.

Excluding considerations of spillway capacity, total cost is now expected to be approximately $81 million.

A risk assessment approach has been used to ensure that work proceeds in a priority order of most effective risk reduction. The ultimate goal is the achievement of risks that are as low as reasonably practicable in line with Australian national guidelines and international best practice.

Expenditure on the works for 2002/03 was $3.9 million, bringing total expenditure to date to $77.9 million. Good progress was achieved throughout the year on Embankment 4, (the bank on the New South Wales abutment). A detailed review in 2001/02 had recommended that it should be modified to provide a filter zone on the downstream side and thus further reduce the risks to the dam were completed during the year. Works included enhanced drainage of the downstream face and toe. Other works related to tidying the site after nearly seven years of remedial works and completing the makeover of the structure, which was originally constructed between 1919 and 1936. Activities included:

- installing a modern lighting scheme to highlight the spectacular form of the spillway structure;
- provision of lightning protection for the spillway structure; and
- construction of a retaining wall between power station and switchyard to stabilise the slope downstream of the embankment.

The Department of Sustainable Natural Resources has been investigating the determination of extreme flood estimates for the Hume Dam and the consequence of these estimates on spillway capacity. In Australian terms, the catchment area of more than 15 000 sq km is large and this has necessitated development of improved ways of estimating extreme floods for large catchments. This leading edge research has progressed slowly but steadily and good progress has been made over the last year. RMW’s Technical Review Committee has provided valuable advice throughout this process.
During the year, a comprehensive data report was finalised and work commenced on modelling and inflow reports. An analysis was also undertaken of the flow capacity of the existing spillway.

A comprehensive cycle of surveillance readings continued to monitor the performance of the modified embankments. Continuing deformations have been consistent with design predictions. However inflows in 2002/03 only resulted in the lake level reaching 30% of capacity (maximum level elevation above sea level 188.79) on 14 August 2002. Accordingly, the detailed program agreed for the first two fill cycles will be continued until after the lake next fills.

**Yarrawonga Weir**

A program of remedial works at Yarrawonga Weir was commenced in 2000, with a focus on improving the seismic capacity of the weir. Physical construction works began in late July 2001. Excavation and earth works were undertaken by plant hire contracts under the direct supervision of Goulburn-Murray Water. In addition major contracts were undertaken for:

- rock and filter columns (Frankipile Australia);
- structural works (Geotechnical Engineering); and
- erosion protection blocks (Austral Constructions).

Works were successfully completed by October 2002.

**Dartmouth Dam**

At Dartmouth Dam, further progress was made with the installation of access walkways across the downstream face. The walkways allow safer access for deformation surveys and reading of surveillance instrumentation. A very innovative design which takes account of the requirement for manual construction on a steep rockfill slope and readjustment to account for ongoing deformation of the main embankment has been developed.

Work also continued on protection of areas of the spillway cascade that had eroded during previous flood events.

Major bushfires in north-east Victoria in late January and early February 2003 burnt 95% of the Dartmouth catchment. The fires burnt up to the dam causing damage to controls and communication cables and minor damage to public facilities including toilets and picnic areas. Site staff worked with other members of the local community to limit damage to houses, offices, workshops and other infrastructure. The commitment and dedication of staff in such difficult circumstances is very much appreciated.
Mildura Weir

Detailed inspection of five standard trestles, that had been removed for maintenance in May 2001, revealed extensive corrosion. A study of repair or replace options led to a decision to bring forward the fabrication of five new trestles. The trestles were delivered in May 2002 in time for installation following removal of the weir and coinciding with the end of the irrigation season.

A further five replacement trestles were ordered to be available by late spring, in case a further removal of weir was needed due to flooding, with four more trestles being delivered by May 2003. All nine trestles were installed during a weir removal in May 2003.

In June 2003, work commenced on a major overhaul of the lock chamber. This will include:

- replacing four filling valves;
- replacing one lock gate;
- installing improved walkways on lock gates; and
- repainting three existing lock gates.

Other locks and weirs

A program to improve safety for operators of locks was continued with a system of concrete barriers being installed at Lock 8 to provide safer transit for boats when the lock remains in use on rising or falling floods.

A comprehensive performance review of custom-built, track-mounted mobile cranes at locks and Weirs 1 to 10 and 15 has been undertaken. A program is being developed to ensure these cranes remain fully serviceable over the next decade.

Barrages

Good progress on occupational health and safety improvements at Tauwitchere and Ewe Island barrages was made through the year. Upstream handrails (total length 1.56 km) were being installed on these two barrages and work on installing downstream handrails and lift and latch mechanisms for 245 taintor gates had begun. Detailed design for a hydraulic control system for remote operation of up to 50 taintor gates was completed as was design of a prototype vertical axis spindle gate for Mundoo and Boundary Creek barrages.
Navigable Pass and Fishway Project

The implementation phase of the Navigable Pass and Fishway Project commenced in mid-2001. The project is being managed by SA Water under the direction of a project steering committee, chaired by RMW, with representatives of SA Water; Department of Water, Land and Biodiversity Conservation (South Australia) and State Water (New South Wales).

The project involves:
- replacing the navigable pass section of the weir;
- repairing or replacing piers constructed in the 1960s when the navigable pass sections were narrowed; and
- constructing a vertical slot fishway.

The first two locks and weirs to be modified are Locks 7 and 8 as these are the two that most frequently require removal and reinstatement of navigable pass sections during floods.

Concept designs for the navigable pass section were finalised in early 2001 following testing of a prototype of the proposed removable bridge section, that will sit on top of half height concrete piers. The stoplogs and bridge sections will be removed during floods, and vessels will pass over the half height piers that will be submerged by at least 1.9 m of water.

To oversee the fishway program and to provide advice to the MDBC on fish passage issues throughout the Basin, the MDBC has established a Fish Passage Reference Group (FPRG). The FPRG is comprised of fish passage specialists from New South Wales, Victoria, South Australia and Queensland; an independent fish scientist; and engineers and river operators with an interest in fish passage. It is chaired by an officer of the MDBC.

During the year activities on the Navigable Pass and Fishway Project have included:
- completing re-design of fishways at Locks 7 and 8;
- culling and analysing tenders for construction works at Locks 7 and 8;
- awarding construction contracts for works at Locks 7 and 8 to York Civil Pty Ltd;
- commencing detailed design of works for Locks 9 and 10; and
- continuing the fish monitoring program.

By the end of the financial year, substantial progress had been made at Lock 8 where works were more than 60% complete. At Lock 7, works were 30% complete.
The safety of staff, their families and the general public is a high priority at all River Murray assets. A number of the initiatives with a safety focus were continued in 2002/03, including:

- further progress towards replacement of navigable passes;
- installing safety barriers and handrails on locks;
- installing child-safe fencing at Lock 15;
- further progress towards the OH&S upgrade of Tawitchere and Ewe Island barrages;
- improving documentation of OH&S risk assessment processes and safe working procedures;
- improving access onto the downstream face of Dartmouth Reservoir;
- installing a personnel-rated hoist on the gantry at Torrumbarry Weir;
- providing safe access to the spillway gates at Yarrawonga Weir;
- improving practices for removing/reinstalling Mildura Weir; and
- safety improvements at Tawitchere Lock.

Salinity mitigation schemes (interception schemes and river management issues) that achieve targets and are operated cost-effectively.

There are 13 locks on the lower Murray from Blanchetown (Lock 1) to Torrumbarry (Lock 26). Locks 13 to 14 and 16 to 25 were never built, so navigation upstream of Mildura is only possible when river flows are high. There is also a lock at the Goolwa Barrage and a small hand-operated lock at Tawitchere Barrage.

These locks are available for use by the public every day of the year except Christmas Day. The locks are used by a wide variety of vessels from large river boats with barges to canoes. Tourist houseboats are frequent users of the locks, as are tourist vessels, particularly at Mildura.
Three unscheduled outages of a lock were recorded in 2002/03:

- at Lock 5, Paringa SA (near Renmark), an upstream gate required emergency repairs, necessitating closure of the lock for 28 hours in October 2002; and
- two minor outages of Lock 8 due to a power interruption and failure of a hydraulic pump resulted in unavailability of the lock for a few hours but caused little disruption to boat traffic.

Planned outages of locks were undertaken for a number of reasons including:

- refurbishment of lock gates and valves; and
- removal of weir trestles and consequent lowering of the weir pool at Mildura.

At Torrumbarry and Euston weirs, use of the locks is dependent on high river flows to maintain satisfactory tailwater levels. Skippers of vessels wishing to use these locks are accustomed to maintaining close contact with lock staff to monitor likely river conditions.

In June 2003, Mildura Lock was taken out of service for a major overhaul of the lock chamber including replacement of filling valves and one lock gate, that had been damaged by a vessel.

**NEW INTERPRETATIVE SIGNAGE FOR LOCKS AND WEIRS**

Each year hundreds of people visit the grassy picnic areas on the banks near the locks and weirs along the River Murray from north of Mildura in Victoria to the Murray Mouth at Goolwa in South Australia. Each picnic area has display stands and over the past year a series of posters were produced to help visitors understand the operations of lockmasters and the colourful history of River Murray navigation. Three of the new posters tell the individual stories of locks and weirs at the Murray Mouth, Blanchetown (Lock 1) and Renmark (Lock 5) respectively. The individual stories of the other locks are being planned.
Cost-effectiveness

In 2002/03 navigation services were provided at a cost of $1.275 million compared with a budget for the year of $1.304 million.

Agreed river salinity targets met through operation of interception schemes and river operations

For the protection of key assets and values across the Basin and for maintenance of water quality of the shared rivers, a basin salinity target (Morgan Target) that is to maintain the river salinity at Morgan at less than 800 EC* for 95% of the time during the benchmark period has been established.

Table 6. Historical salinity data at Morgan.

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Average (EC)</th>
<th>50th percentile (EC)</th>
<th>95th percentile (EC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 2002 to June 2003</td>
<td>494</td>
<td>476</td>
<td>678</td>
</tr>
<tr>
<td>5 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1998 to June 2003</td>
<td>511</td>
<td>508</td>
<td>682</td>
</tr>
<tr>
<td>10 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1993 to June 2003</td>
<td>549</td>
<td>549</td>
<td>800</td>
</tr>
<tr>
<td>25 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 1978 to June 2003</td>
<td>613</td>
<td>592</td>
<td>1023</td>
</tr>
</tbody>
</table>

Cost-effectiveness of operating existing salt interception schemes

A major part of the BSMS includes a number of salt interception schemes built since 1980 which now divert more than 1100 tonnes of salt per day away from the River Murray (see Figure 5). Salt interception schemes are large scale groundwater pumping projects that intercept saline water flows before they enter the River Murray and dispose of them, generally by evaporation.

RMW operates seven jointly funded salinity mitigation schemes along the River Murray. These schemes intercept saline water flows that would otherwise enter the river thereby increasing its salinity to unacceptable levels.

* An EC unit is a measure of salinity concentration.
These schemes, together with other drainage management works, have resulted in an estimated benefit of about 200 EC at Morgan in ‘South Australia.

Integration and optimisation of salt interception in the Sunraysia region

In 1999, RMW commissioned a study to assess the benefits of an integrated management approach to salt interception schemes within the Basin and to identify schemes that should be managed in this way. This study identified that the potential gains by integrated management are considerable in the Sunraysia region and that the realignment of operating responsibility for schemes in this region should be addressed as a priority.

As a consequence, a comprehensive study to investigate possibilities for optimising salt interception in the Sunraysia region was initiated during 2000/01. The study takes a regional ‘no borders’ approach incorporating the Mildura–Merbein, Buronga, Mallee Cliffs and Psyche Bend salt interception schemes.

**Figure 5. Salt interception schemes.**

Key

1. Walkerie Groundwater Interception Scheme
2. Woolpunda Groundwater Interception Scheme
3. Noora Drainage Disposal Scheme
4. Rufus River Groundwater Interception Scheme
5. Curlwaa Groundwater Interception Scheme
6. Lake Hawthorn Drainage Diversion Scheme
7. Buronga Groundwater Interception Scheme
8. Psyche Bend Drainage Diversion Scheme
9. Mildura-Merbein Groundwater Interception Scheme
10. Mallee Cliffs Groundwater Interception Scheme
11. Barr Creek Drainage Diversion Scheme
It is expected that this study and a proposed work program will be presented to the MDBC for consideration in 2003/04.

**VICTORIA**

**Barr Creek Drainage Diversion Scheme**

The Barr Creek Drainage Diversion Scheme was effective in reducing the salt load reaching the River Murray. With the exception of a number of short duration pump outages due to either power failure or repairs, pumping from Barr Creek was in accord with the current operating rules. To improve the efficiency of this drainage disposal scheme a new weir immediately downstream of the pumps was constructed during the year. This new weir is larger than the existing weir ensuring that the frequency of overtopping of the weir during periods of high river flows in the River Murray will be reduced.

**Mildura–Merbein Scheme**

The Mildura–Merbein Scheme operated in accordance with the operating criteria, although pumping rates on some of the wellpoints were slightly below design capacity. Due to a recurring gas problem in the pumping line, Pump Site 15 has been out of service for most of the year. Remedial investigations are continuing in conjunction with investigations to optimise salt interception within the Sunraysia region.

Due to low flow conditions in the River Murray and the dry conditions experienced in the region during the year, no releases were made to the river from Lake Hawthorn. In addition, the dry conditions experienced during the year and the impact of improved irrigation practice resulted in a reduction of irrigation drainage water requiring disposal. Hence pumping to the Wargan Basins during the year was minimal. This has resulted in maintenance of low storage volumes in these basins.

**Pyramid Creek Salt Interception and Harvesting Scheme**

In December 2002, approval was granted to construct the Pyramid Creek Salt Interception and Harvesting Scheme as a joint work as defined in Schedule C of the Agreement at a total estimated cost of $12.7 million.

Pyramid Creek is an enlarged natural stream in northern Victoria that is used as a major irrigation carrier. Approximately 50 000 tonnes of salt enters Pyramid Creek each year from highly saline regional groundwater discharge mainly in the upper reaches. Water not diverted for irrigation eventually outfalls to the River Murray via the Kerang Lakes, the Loddon River and the Little Murray River.

The groundwater interception scheme will intercept this saline groundwater before it impacts on the Ramsar-listed wetlands (Kerang Lakes) and the River Murray, and will provide 4.3 EC benefits to the River.
Murray at Morgan. In addition, to offset the operations and maintenance costs of this scheme, a financial arrangement is currently being negotiated with a commercial salt harvester to harvest salts from this interception scheme. An agreement is currently being drafted to formalise arrangements.

During 2002/03, all necessary development approvals were obtained and work has now commenced on Stage 1 of this project.

NEW SOUTH WALES

Mallee Cliffs Interception Scheme
Rehabilitation of the enhanced leakage pit in the Mallee Cliffs Interception Scheme was completed successfully and the pit was put back into service and operating effectively. The road network within the disposal basin together with the access roads to the pump sites were rehabilitated to provide all weather access. Scheme performance during the year has ensured that the scheme continues to significantly reduce impacts of saline groundwater on downstream salinity. Efforts to optimise the performance of the scheme to provide the best possible outcome for the River Murray are continuing.

Buronga Salt Interception Scheme
The Buronga Interception Scheme was originally built in 1979 with upgrade work carried out in 1988. It is now in need of a major upgrade with infrastructure breakdowns continuing to undermine effective performance of the scheme. Design of the rehabilitation and augmentation works to replace the deteriorating infrastructure and provide for additional interception capacity for the Sunraysia region is now well advanced. Construction is expected to commence in the early part of 2004.

SOUTH AUSTRALIA

Woolpunda Salt Interception Scheme
In general, the Woolpunda Salt Interception Scheme has achieved its design targets. Consequently the pumping rates were reviewed resulting in a general reduction of flow and opportunity to maximise off-peak power use.

Waikerie Salt Interception Scheme
A performance review of the Waikerie Salt Interception Scheme has indicated that in a number of locations the bore pumps are achieving their design targets while there is indication that some of the extraction bores are overpumping and there is scope for reducing the flow rates of these pumps while still maintaining interception efficiency.
The construction of Waikerie Phase IIA was completed during the year extending the protection of the River Murray westward and addressing the required enhancements of the original works. This expansion to the scheme was required due to the increase in salt loads in the area since the original scheme was commissioned in 1992.

During the year the Institution of Engineers Australia recognised the combined Waikerie and Woolpunda salt interception schemes for achievements in sound environmental and outstanding engineering practice. These awards showcase the finest engineering Australian industry has to offer. Projects attaining recognition at the national level are deemed to be truly outstanding achievers and pre-eminent in their field.

The MDBC together with its constructing authority, South Australian Water Corporation, were honoured by winning both the Australian environmental engineering excellence award together with the highest accolade for engineering excellence—the Sir William Hudson Award.

**Bookpurnong Salt Interception scheme**

In March 2003, the Ministerial Council approved the construction of the Bookpurnong Salt Interception Scheme as a shared scheme between a joint work and State action as defined in Schedule C of the Agreement at a total estimated cost of $11.1 million.

The *Bookpurnong – Lock 4 Preliminary Land and Water Management Plan* prepared in 1999 by the Loxton and Bookpurnong Local Action Planning Group identified the need for an integrated solution to issues of floodplain degradation, irrigation drainage disposal and saline groundwater discharge to the River Murray. The plan included three main elements:

- improvement of on-farm irrigation efficiency;
- interception of saline groundwater before it reached the river; and
- disposal of intercepted water through an existing and underused pipeline to Noora Basin.

It is estimated that the interception of saline groundwater will achieve a total benefit at Morgan of 32.5 EC (20.5 EC for the joint works component and 12.0 EC for the State action component).

All necessary development approvals have been obtained and detailing of the final design of the scheme, survey and the land acquisition processes have commenced. It is expected that construction of this scheme will begin early in 2003/04.
**Loxton Salt Interception Scheme**

The Loxton Salt Interception Scheme is an extension of the Bookpurnong Salt Interception Scheme and was also identified in the *Bookpurnong – Lock 4 Preliminary Land and Water Management Plan*.

In May 2003, the Ministerial Council agreed to progress the Loxton scheme to a construction-ready stage with a final proposal for the scheme to be presented to Council in 2003/04. This decision was based on preliminary indications that the scheme may achieve a total benefit at Morgan of 16.35 EC at a total estimated construction cost of $24 million.

Similarly to the Bookpurnong scheme, it is also proposed that this scheme be developed as a shared scheme between a joint work and State action as defined in Schedule C of the *Agreement* (12.4 EC the joint works component and 3.9 EC for the State action component).

It is expected that construction of this scheme will commence late in 2003/04.

**Rufus River Salt Interception Scheme**

Rehabilitation of the interception scheme including the installation of bacterial iron control measures has now been completed on all four wellpoint lines. Since the completion of this work the scheme has been successfully operating in accordance with the operating criteria. All four wellpoint lines have been drawn down to just below target groundwater levels. Work is expected to be undertaken in 2003/04 to review the performance of the scheme partly in accordance with the requirements of Schedule C to the *Agreement* and also to assist in optimising the scheme performance.

*New and upgraded salinity mitigation schemes in place*

The efficiency and capacity of existing schemes is being progressively increased, and further schemes are being investigated and constructed. The salt is captured in evaporation basins and investigations are continuing into commercial use of the resulting products. Successful disposal will place salinity mitigation on a more sustainable basis.
3.5 River Murray Water Triple Bottom Line (Sustainability) Report

RMW has adopted sustainability as one of its guiding principles, and is moving to integrate this philosophy into its culture, operations and management systems. The organisation believes that this approach is consistent with the intent of the COAG water reforms that led to its formation, and with the objectives of its stakeholders and community expectations. It is also in harmony with the 2001 independent pricing review that proposed the introduction of an ‘environmental dividend’.

As part of this emphasis, River Murray Water is accounting for its performance by producing an annual ‘triple bottom line’ report. The report covers key environmental, social and economic issues, and is produced in accordance with an accepted standard from the Global Reporting Institute Sustainability Reporting Guidelines (draft 01 April 2002). The following short report is an abbreviated version of that larger report. Reports are being progressively enhanced as experience is gained and detailed performance indicators are developed.

Sustainability strategy

The RMW strategy is based on the Vision for River Murray Water, which has been formally endorsed by the River Murray Water Board and the Ministerial Council:

Within agreed financial, social and environmental objectives, to sustain the supply of water in the River Murray System

This vision is carried forward in the Strategic Plan for 2002 to 2007, which contains as one of its core values and principles:

Environmental consciousness. We will respect and care for the natural environment, promote sustainability, and assess the social, environmental and economic effects of our actions.

This approach is reflected in the 53 specific strategies that are documented in the River Murray Water Strategic Plan for 2002 to 2007, together with performance indicators and target times for accomplishment.

Social bottom line—social objectives

Staff

RMW is a small, strategically focused management unit (Table 7). In fulfilling its operational responsibilities, it also uses the services of:

- constructing authorities (State government organisations which carry out construction, operational management and maintenance activities);
- long-term contractors who undertake ongoing tasks that have been outsourced (e.g. stream gauging); and
individual contractors, consultants and suppliers who are engaged as necessary for specific tasks.

**Table 7. Current staff numbers effectively dedicated to River Murray Water activities.**

<table>
<thead>
<tr>
<th>Staff numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>River Murray Water</strong></td>
</tr>
<tr>
<td>22 (4 management, 14 technical/professional,</td>
</tr>
<tr>
<td>4 administrative and support)</td>
</tr>
<tr>
<td><strong>Constructing authorities</strong></td>
</tr>
<tr>
<td>120</td>
</tr>
</tbody>
</table>

For its own staff, RMW assumes direct responsibility for training, career development, occupational health and safety, and succession planning. Constructing authorities employ staff who are mainly engaged in RMW activities, some of whom are located at structures along the river that are not readily accessible or not well supported with normal community services. RMW takes a special interest in their wellbeing and in the level of amenity available to them.

**Occupational health and safety (OH&S)**

River Murray Water functions include the operation and maintenance of a large number of specialised structures that can pose unusual OH&S risks to both the staff and the public generally. While vulnerability to malicious damage has been generally assessed as low, a number of projects have been carried out as part of a program to systematically reduce health and safety risks (e.g. the major refurbishment of structures, modifications to navigable passes, extension of handrails and mandatory use of safety harnesses and buoyancy devices).

In addition, RMW promotes and takes part in continuing training and operational exercises designed to improve the safety and effectiveness of operations particularly in extreme circumstances.

**Community relations**

RMW’s customers are the States. It has no direct or formal relationship with the ultimate users of the water that it delivers, or with the communities that are affected by its operations. Nevertheless RMW seeks to build cooperative and collaborative relationships with these communities by:

- active participation with community organisations in the development of relevant management plans;
- publication of routine operational advice and other significant events (weekly reports and flow/capacity data on its website); and
providing safe and enjoyable access that is consistent with security considerations to sites that it controls.

Where possible, public access to structures and the surrounding areas is encouraged through recreation facilities such as picnic areas and information bays.

As well as providing public information at its sites, RMW contributes to a range of public education activities including the briefing of overseas delegations and the provision of advice on aid programs. Substantial effort is devoted to consultation and negotiation with a number of State government agencies.

**Environmental bottom line—environmental objectives**

Managing river flows

Central to RMW’s environmental concern is management of the river system itself. Within the organisation’s fundamental responsibility to deliver water in accordance with entitlements, RMW seeks to minimise the undesirable environmental impacts of the interventions that have taken place and obtain the maximum available benefits from activities.

Careful attention was paid to river management during the year as system inflows were among the lowest recorded. River management was dominated by the need to release water from Dartmouth Reservoir to supply the full length of the river. The small amount of water remaining in Menindee Lakes was under New South Wales control in accordance with the Agreement.

Some of the key actions undertaken include:

- recognising river channel limits (Mitta Mitta River and River Murray – Barmah Choke) in operational planning;
- reducing unseasonal forest and wetland flooding in summer;
- controlling water flows to conserve habitat for flora and fauna;
- controlling levels in sensitive areas such as Barmah–Millewa forests and Lake Victoria;
- minimising algal blooms;
- providing for variability of flow during long periods of discharge; and
- releasing environmental flows when possible and appropriate.
MANAGEMENT OF LAKE VICTORIA

Lake Victoria in south-western New South Wales is a key national water course and part of the Murray–Darling system.

As an ancient natural lake, it is an important cultural heritage site for Indigenous people. In the 1920s, the present lake was formed by creating embankments, and inlet and diversion works. In the subsequent decades it has played a key role in water supply regulation, salinity mitigation and environmental flow management of the Murray–Darling system.

Previous management arrangements resulted in the lake being kept close to full for more than 50% of the time. This hydrologic regime was not consistent with protection and enhancement of lake shore vegetation and the shore was susceptible to erosion by wind and wave action.

A serious consequence was damage to Indigenous burial grounds and to cultural heritage in general.

In accordance with prescriptions laid down by the New South Wales National Parks & Wildlife Service the Lake Victoria Cultural Landscape Plan of Management has been prepared. The plan has been developed in close consultation with the traditional Aboriginal (Barkindji) community, local landholders and relevant public agencies.

The plan encompasses a range of works, measures and operating strategies that aim to:

- protect Indigenous burial sites and cultural values;
- enhance vegetation and reduce erosion; and
- enable the lake to continue to play its role as a critical water resource within a set of sustainable environmental values.

It is a balancing act that reflects the cooperation and respect between all interested parties.

On 26 October 2002, the Lake Victoria Cultural Landscape Plan of Management, incorporating an agreed operating strategy, was formally launched at Lake Victoria. The event was attended by the Barkindji Elders and Community together with local landholders and agency representatives.
On the following day, 27 October 2002, the Barkindji Elders and Community with many others held a memorial service at Lake Victoria in remembrance of those who died in the Rufus River Massacre in 1841. A memorial stone, overlooking the lake was dedicated. It sits beside another memorial stone commemorating the airmen who died while on flight training at the lake during World War II.

Further highlights for the year include:

- monitoring and enhancement of burial protection works;
- finalisation of the purchase of two properties adjacent to the lake as part of a long range initiative to reduce stock grazing pressures on the erosion prone areas around the lake;
- controlled grazing trials to determine the most effective management of grasslands close to the lake;
- feral animal and weed control measures; and
- a large increase in vegetation biomass from the combined effects of improved water level management and the reduction of stock grazing pressures.

The MDBC is committed to achieving the objects of the *Lake Victoria Cultural Landscape Plan of Management* in cooperation with the Indigenous Community and local landowners.

Lake Victoria Commemoration Ceremony 2002. Oil painting by Gabrielle Dole
Salinity mitigation

River Murray Water operates seven jointly funded salinity mitigation schemes along the River Murray. These schemes intercept saline water flows that would otherwise enter the river thereby increasing its salinity to unacceptable levels.

The efficiency and capacity of existing schemes is being progressively increased, and further schemes are being investigated and constructed.

Extended drought conditions have resulted in relative low salinity in the lower River Murray during 2002/03. The principal contributors were:

- low tributary inflows;
- lower groundwater levels on the floodplain and hence reduced discharge of saline groundwater;
- effective operation of salt interception schemes; and
- transfer of large volumes of high quality water from Dartmouth Reservoir.

However in the lower lakes the lack of flow to the sea has resulted in an accumulation of salt—effectively, the salt that has passed down river has been stored in the lower lakes.

Electricity generation and consumption

Most activities of RMW are not energy-intensive, but the operation of salinity mitigation schemes requires pumping and is a significant energy user. A total of 7.1 GWh was used for this purpose during 2002/03. Electricity consumption is minimised by careful control and good maintenance.

This consumption is more than offset by the production of a total of 785 GWh of 'green' hydro-electric power from water stored in structures operated by RMW. The significant increase in hydro-electricity generation (378 GL in 2001/02) was due to drought operation of Dartmouth Reservoir resulting in transfers of (378 GL of water downstream for consumptive use.
Native fish populations in the river, such as Murray cod and golden perch, have decreased markedly since the introduction of the control structures operated by RMW. One of the reasons is that the fish like to travel long distances to breed and the structures impede their movement.

**Fish Passage**

In early 2003, contracts were awarded for modifications to weirs and Locks 7 and 8, including the construction of new vertical slot fishways. These are the first two structures to be built as part of a program initiated by the Ministerial Council in 2001 to enable fish passage from the sea to Hume Reservoir (a distance of 2225 km).

Other related activities during the year included:
- detailed design of fishways at Goolwa and Tauwitchere barrages;
- concept design of fishways for Locks 9 and 10; and
- detailed design of Dennil fishway for Euston Weir.

Staff at Torrumbarry Weir, in association with staff from Arthur Rylah Institute have invented a carp separation cage for use in vertical slot fishways. While further refinements are still required, initial testing is very encouraging. The cage traps the carp, which tend to swim towards the surface when faced with a submerged barrier, while native fish are more likely to dive deeper and pass underneath the trap.

**Murray Mouth**

By early July 2002, the barrages at the Murray Mouth had been closed for seven months and with persisting drought conditions upstream, there was a strong likelihood that no freshwater would flow to the sea before the spring of 2003.

In September 2002, the Ministerial Council approved funding for a sand pumping project to try to keep open a mouth that was already heavily choked with sand and at risk of closing completely.

Limited connectivity between ocean and Coorong and Goolwa channels was maintained throughout the summer of 2002/03. However, by autumn the mouth remained heavily choked and had narrowed to as little as 20 m wide and 1 m deep.

In May 2003, the Ministerial Council supported an expansion of the current sand pumping project to not only keep the mouth open but also to ensure good connectivity with the Coorong over summer of 2003/04. To achieve this a second dredge was mobilised during June 2003.
Economic bottom line—economic objectives

Commercial structure

RMW operates as a business unit of the MDBC. Its revenue comes mainly from the three States that are its customers, with charges based on a surrogate pricing model. Charges are set on a ‘break-even’ basis and no dividends are paid. However, in 2002/03 and in accordance with the objective of providing environmental dividends, above-budget income from unexpectedly high hydro-electric generation arising from high releases from Dartmouth and Hume storages due to drought conditions, were provided to MDBC as a contribution to achieving environmental objectives.

A summary of the income and expenditure statement for 2002/03 is given in Table 8. Table 9 shows the volumes of water delivered for the year.

Asset sustainability

It is anticipated that future income and expenditure statements will include an expense item ‘renewals annuity’. The purpose of a renewals annuity is to enable funds for the renewal, replacement and refurbishment of infrastructure assets to be provided on a relatively consistent basis from year to year rather than raising the funds in the year in which the expenditure actually incurred.

This achieves reasonable stability in operating costs from year to year and is consistent with COAG water reform principles. It also provides a sustainable approach to the long-term operation of the infrastructure assets controlled by RMW and the preservation of their service potential.

Economic impact in the region

Approximately 94% of RMW expenditure is in the States that are its customers. In 2002/03, a total of $42.0 million was expended by the constructing authorities (State government agencies in the three States) in connection with RMW activities (Table 8).
### Table 8. Income and expenditure (2002/03).

<table>
<thead>
<tr>
<th></th>
<th>2002/03 NSW ($'000)</th>
<th>2002/03 Vic ($'000)</th>
<th>2002/03 SA ($'000)</th>
<th>2002/03 Total ($'000)</th>
<th>2001/02 Total ($'000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INCOME</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water storage and supply—access</td>
<td>8 632</td>
<td>7 550</td>
<td>4 028</td>
<td>20 210</td>
<td>18 546</td>
</tr>
<tr>
<td>Water storage and supply—consumption</td>
<td>3 699</td>
<td>3 235</td>
<td>1 727</td>
<td>8 661</td>
<td>7 948</td>
</tr>
<tr>
<td>Salinity mitigation</td>
<td>2 021</td>
<td>2 021</td>
<td>2 020</td>
<td>6 062</td>
<td>6 537</td>
</tr>
<tr>
<td>Specific beneficiaries</td>
<td>890</td>
<td>890</td>
<td>1 281</td>
<td>3 061</td>
<td>2 847</td>
</tr>
<tr>
<td><strong>Subtotal</strong> (income from primary customers)</td>
<td>15 242</td>
<td>13 696</td>
<td>9 056</td>
<td>37 994</td>
<td>35 878</td>
</tr>
<tr>
<td>Hydro-electricity generation</td>
<td>2 191</td>
<td></td>
<td></td>
<td>674</td>
<td></td>
</tr>
<tr>
<td>Other operating income</td>
<td></td>
<td>507</td>
<td></td>
<td>367</td>
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<tr>
<td>Interest</td>
<td></td>
<td>845</td>
<td></td>
<td>1 048</td>
<td></td>
</tr>
<tr>
<td><strong>Total income</strong></td>
<td></td>
<td>41 537</td>
<td></td>
<td>37 967</td>
<td></td>
</tr>
<tr>
<td>Add: 2001/02 carried forward</td>
<td>10 967</td>
<td></td>
<td></td>
<td>8916</td>
<td></td>
</tr>
<tr>
<td>Less 2002/03 carried over</td>
<td>-8 925</td>
<td></td>
<td></td>
<td>-10 967</td>
<td></td>
</tr>
<tr>
<td><strong>Total recurrent expenditure</strong></td>
<td>21 881</td>
<td>19 811</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OPERATING SURPLUS</strong></td>
<td></td>
<td></td>
<td></td>
<td>21 698</td>
<td>16 105</td>
</tr>
<tr>
<td>(available for investigation and construction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commonwealth contribution</td>
<td>5 927</td>
<td></td>
<td></td>
<td>6 128</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL AVAILABLE FOR INVESTIGATION AND CONSTRUCTION</strong></td>
<td>27 625</td>
<td>22 233</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>These funds were applied to investigation and construction expenditure of:</td>
<td>22 914</td>
<td>21 951</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9. State diversions from the River Murray and the lower Darling River during 2002/03 (volumes of water delivered, GL).

<table>
<thead>
<tr>
<th></th>
<th>River Murray Water</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(GL)</td>
</tr>
<tr>
<td>New South Wales</td>
<td>878*</td>
</tr>
<tr>
<td>Victoria**</td>
<td>1 775*</td>
</tr>
<tr>
<td>South Australia</td>
<td>750.1#</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3 403.1</td>
</tr>
</tbody>
</table>

*  Operational data, subject to revision

** While NSW and Victoria share the water of the Upper Murray equally, Victoria typically provides for greater reserves at the end of each year than does NSW. In effect, much of the Victorian consumption in 2002/03 was from reserves.

#  More accurate/corrected data.
Policies, programs, systems and knowledge which contribute to achieving sustainable natural resources management and help to establish an appropriate balance between the resource needs of the environment and human needs.
4.1 Strategic directions

Natural Resources policy development grew and shifted in balance in 2002/03 and was dominated by The Living Murray initiative. The former ‘environmental flows and water quality objectives’ project was also expanded at the direction of the Ministerial Council and the MDBC. By the end of June 2003, The Living Murray’s new project arrangements embraced:

- economic and social analyses;
- water recovery mechanisms;
- sustainability of irrigation regions;
- interstate water trade;
- River Murray environmental management;
- an implementation program for works; and
- environmental water accounting.

As a consequence, further organisational change was necessary to rebalance the work load across the Natural Resources executive team. Direction from the MDBC and a functional analysis by the MDBC’s Chief Executive resulted in the approval of:

- General Manager Natural Resources was appointed to become Director of The Living Murray initiative;
- Director of Rivers and Industries assumed responsibilities for key Living Murray projects, the irrigation regions program, rivers program and interstate water trade, thereby integrating key knowledge generation around The Living Murray;
- Director of Integrated Catchment Management combined existing ICM responsibilities with new responsibilities for the dryland regions program, salinity programs and was tasked to assist the General Manager; and
- the River Murray Environmental Manager was tasked to focus on developing the function of environmental management for The Living Murray and an implementation program of works.

Such changes have consequences for all Natural Resources staff, and program and project managers in particular. At their instigation, a broader change agenda was adopted under the heading ‘NR Re-think’. An action plan that includes evolution to a teams-based approach to organisational output, better internal communications and making project management more robust and extensive, was finalised by June 2003.

While The Living Murray initiative dominated policy development, work continued under the three-year strategic directions from 2001/02.
Specific achievements of note were:

- MDBC approval of the protocols for the *Basin Salinity Management Strategy*;
- Ministerial Council approval of the *Native Fish Strategy*; and
- consolidation of the ICM projects, in particular the Ministerial Council’s *Indigenous Action Plan*, a regional ICM baseline study, performance measures for evaluating implementation of the ICM Policy and preliminary work on the Natural Resources Murray–Darling Basin InfoBank Project.

### 4.2 Delivering the Integrated Catchment Management Policy

The Integrated Catchment Management Policy (ICM Policy) was released jointly by the Ministerial Council and the CAC on 5 June 2001. It sets out a ten-year time frame for development of Basin strategies to meet catchment health targets. The intent of the policy is to limit the degradation of the Basin’s natural resources and allow the Basin community to set those limits in full knowledge of the trade-offs that are being made.

The areas of catchment health identified for specific action within the ICM Policy include water quality (in-stream salinity, nutrients/other aspects affecting algal blooms), water sharing of both surface water and groundwater, riverine ecosystem health and terrestrial biodiversity.

### KEY ELEMENTS OF THE ICM POLICY

Goals, values and principles to guide community, industry and government partnerships

Balance between environmental health, social wellbeing and economic productivity

Targets for catchment health to limit the stresses that we place on the natural resources of the Basin

Knowledge generation and sharing to improve decision making by all partners

Capacity building for all partners to play their part

Catchment approaches to planning, implementing and evaluating actions to manage natural resources

Catchment planning linked with land use planning

Clear roles, responsibilities and accountabilities
4.3 Resourcing the ICM Policy

The ICM Policy is not supported by a specific funding program. Rather, the Australian and State governments provide funding to implement the policy through their own programs.

All States in the Basin have now signed bilateral agreements with the Australian Government under the National Action Plan for Salinity and Water Quality (NAP).

- South Australia signed in June 2001.
- Victoria signed in October 2001.
- Queensland signed in March 2002.
- New South Wales signed in May 2002.

The NAP involves a joint Australian Government and State funding package of $1.4 billion for targeted action in regions that are highly affected by salinity and water quality problems. It takes place over a period of seven years and will be relevant to most catchments in the Basin. The Natural Heritage Trust (NHT) has been extended (NHT Extension), with funding of a further $1 billion over five years, and will further support activities across the Basin. Each State and Territory has a range of funding programs that also support implementation of the ICM Policy.

The coordinating mechanisms for investments under the ICM Policy are the integrated catchment management plans of the 19 regions of the Basin. Revision of these plans has been undertaken during 2002/03 and will continue into the future to meet requirements of investors.

Knowledge is a key component of natural resources planning and management. The MDB invests in knowledge to support implementation of the ICM Policy, and to supplement the work of research and development organisations, and other groups working to generate knowledge for future decision making (see KPA 6, p. 67).
4.4 Performance reports

KPA 5. Integrated catchment management

Sub-output

Policies, processes and information that support institutional arrangements enabling effective partnerships for ICM throughout the Basin and effective participation by the Basin community.

Performance assessments and achievements

Adoption of an ICM policy for the decade 2001–2010 and progress in its implementation

Work commenced on an ICM Policy Implementation Plan as the ICM Policy had no detailed implementation pathway. A first step in developing the implementation plan has been to review and characterise ICM implementation across the Basin—recognising that there has been two years of implementation since the release of the ICM Policy in June 2001 (See KPA 8, p. 97). Notwithstanding, work continues on component strategies of the ICM Policy and these are summarised below.

The Basin Salinity Management Strategy (BSMS) is the first strategy developed under the ICM Policy. It complements and strengthens the approach taken by the NAP in the Basin, as well as a number of other Australian Government and State initiatives. Two significant milestones were achieved in 2002/03 with an endorsement of a revised Schedule C to the Agreement and supporting BSMS operational protocols.

Activities under The Living Murray and the Sustainable Rivers Audit (SRA) will inform the setting of targets for water sharing and riverine ecosystem health, and the approach will be incorporated into national frameworks for monitoring and evaluation.

The MDBC Terrestrial Biodiversity Project was established in 2002/03 to develop the native vegetation and terrestrial biodiversity components of the ICM Policy commitment. This project will build on the Australian Terrestrial Biodiversity Assessment 2002 (NLWRA 2002) and the policy issues outlined in the Sustaining our natural systems and biodiversity report to the Prime Minister’s Science, Engineering and Innovation Council (PMSEIC 2002).

Effective communication in MDBC projects which reflects the Initiative Communication Strategy

The Natural Resources Communication Plan was prepared to provide a framework and a set of integrating activities to improve the dissemination and adoption of knowledge products generated under the Natural
**Resources Knowledge Plan 2003-04 to 2005-06.** A set of performance measures detailed in the communication plan will be the basis for evaluation of knowledge outcomes and future reporting.

In 2002/03, the guide to preparing communication strategies (developed by the MDBC in 1999) continued to be used as a basis for planning communication activities within the MDBC Office. This guide has also been used by seven other natural resources management organisations within the Basin as a basis for a strategic approach to planning communication activities.

The communication strategy Initiative continues to provide a foundation for more effective communication within a wide range of MDBC programs and projects, ensuring a focus on the early identification of key communication partners, establishment of key communication messages and definition of desired relationships.

In 2002, the approach used by the Initiative was also used by an overseas World Bank project in Rajasthan as a framework for planning communication activities. This six-year watershed project will be using this approach in strategic planning and development of detailed communication plans. The process used by the MDBC is also being implemented in agricultural extension programs coordinated by Kansas State University in the United States of America. This overseas exchange has provided an opportunity to enhance and develop aspects of this process and contribute to its scheduled review in 2003. It has also allowed current MDBC projects to benefit from information exchange on the latest initiatives in science communication with other similar large Basin-wide catchment projects.

There has been a noticeable increase in the demand for web access to project information. Throughout the latter half of 2002/03, the MDBC website consistently recorded over a million hits per month with the website able to meet a wide range of demands for information in different formats, from detailed scientific reports, specific natural resource information and regular River Murray updates.

In 2002/03 the on-line ordering system for MDBC publications was completed. This system provides users with a contemporary on-line ordering system for the wide array of publications produced by the MDBC. It has resulted in a streamlined ordering process for hard copy and enhanced search capacity for people requiring information either by categories, document type or through the relevant MDBC division.

Provision of electronic copies of a large number of MDBC documents has meant that the MDBC is still able to service the demand for hard copies of documents despite an annual increase of at least 30% in sourcing of information from the MDBC website.
In addition, a new education page for children, Basin Kids, was completed in 2002. This site has been specifically developed for school children and contains project information (in the form of a revised children’s encyclopedia section), interactive games and a gateway to other links relating to natural resources management.

Effective consideration of human dimension matters in MDBC projects

The social, cultural, institutional and economic aspects of natural resources management in the Basin are being addressed by the MDBC’s Human Dimension Strategy: People as an Integral Part of the Initiative. A number of activities have been undertaken to provide information, insights and opportunities for future MDBC work to meaningfully consider people and their relationship with the landscape in natural resources management. The MDBC has now established itself in the network of social and institutional research, discussion and activity that is currently taking place among research institutions, catchment management organisations and government agencies.

Course one of the Murray-Darling Basin Leadership Program was successfully completed during 2002/03, with the Ministerial Council approving the continuation of the pilot for a further two years. This year saw the development of a Community Engagement Toolkit that provides a framework for those wanting to develop, design or conduct effective community engagement processes.

Work continued in 2002/03 to explore ways in which a multiplicity of community sectors access information and become involved in natural resources management (collaborative project with the National Museum of
Australia and University of Tasmania). Studies focusing on education and 
extension within rural industries are being undertaken to support capacity 
building and thereby increase involvement in natural resources 
management (MDBC being a party to a cooperative venture with the Rural 
Industries Research and Development Corporation).

Natural resources information management within the MDBC

Natural resources information represents a key resource for the MDBC—
building knowledge management capacity and improving information 
access and integration is fundamental to providing a sound foundation for 
ICM.

A core initiative to build this capacity is the MDB InfoBank project 
(InfoBank). The key objectives for InfoBank are to:

- provide a coordinated point of access to objective and authoritative 
  knowledge and information resources on the status, trends and future 
  of the Basin environmental, social, economic and institutional 
  resources;
- develop and support information management capacity and expertise 
  with robust knowledge management systems and processes; and
- implement common information exchange, and sharing protocols and 
  processes to promote resource sharing and coordination with other 
  natural resources management practitioners across the Basin.

InfoBank development work has progressed from concept to design and 
testing over 2002/03. Public release of a web-based information service is 
planned for March 2004.

Following the 2002 Geographic Information Systems Review, the Natural 
Resources Information Unit has implemented Australia and New Zealand 
Land Information Council (ANZLIC) version 2 standards for spatial data. 
The MDBC has updated its Australian Spatial Data Directory (ASDD) facility 
to improve spatial data discovery, as part of an ongoing implementation 
and review of information sharing policies.
KPA 6. Land and water management

Sub-output

Policies and programs for sustainable natural resources management, based on sound knowledge and information systems, that take account of relevant social, economic and environmental matters.

KPA 6 Land and water management—knowledge

Performance assessments and achievements

Strategic Investigations and Education program is well managed and supports knowledge generation in priority areas.

The total budget for the Strategic Investigations and Education (SI&E) funding program for 2002/03 was $8.45 million. With no carryover from 2001/02, this was made up entirely of annual contributions from contracting governments. In 2002/03 the SI&E Three Year Rolling Plan was replaced by an Integrated Knowledge Plan. However, the program for 2002/03 continued to support a number of projects for which funding had been committed under the Three Year Rolling Plan. A number of these commitments extend into 2003/04 and 2004/05.

During the year the program implemented recommendations from the review by the President of the MDBC. These recommendations were that the development and approval of SI&E investment should not be beyond budget capacity and that there should be limitations on the level of funds that could be carried forward into the following year.

An intensive review of all projects and their priorities enabled some commitments to be deferred, some to be scaled down and some to be funded from other programs. By the end of the year the funding commitments during 2002/03 were reduced to $8.5 million (see Table 10 for a breakdown of funding commitment by program).

Program coordinators continued to manage individual SI&E projects to ensure that contractual obligations during the year were being met.

Table 10. SI&E commitments in 2002/03.

<table>
<thead>
<tr>
<th>Program area</th>
<th>Ongoing projects (number)</th>
<th>Ongoing projects ($ million)</th>
<th>New projects (number)</th>
<th>New projects ($ million)</th>
<th>Total projects (number)</th>
<th>Total projects ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rivers Program</td>
<td>29</td>
<td>2.5</td>
<td></td>
<td></td>
<td>29</td>
<td>2.5</td>
</tr>
<tr>
<td>Landscapes and Industries</td>
<td>50</td>
<td>5.4</td>
<td>5</td>
<td>0.3</td>
<td>55</td>
<td>5.7</td>
</tr>
<tr>
<td>Industries Program</td>
<td>7</td>
<td>0.3</td>
<td>2</td>
<td>0.0</td>
<td>9</td>
<td>0.3</td>
</tr>
<tr>
<td>ICM Business Program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>8.2</td>
<td>7</td>
<td>0.3</td>
<td>93</td>
<td>8.5</td>
</tr>
</tbody>
</table>

Natural resources business
KPA 6 Land and water management—**water regulation and statutory assessment**

**Performance assessments and achievements**

*Information systems support statutory functions and related decision making and meet best practice standards*

The MDBC has commenced planning and construction of an information system, InfoBank, to facilitate access to a broad range of data that are essential to help fulfil the water regulation and other statutory assessment requirements of the *Agreement*. This system will facilitate reporting, evaluation and monitoring of natural resources management-related issues in the Basin.

Under the superseded Schedule C of the *Agreement*, the Victorian, New South Wales and South Australian governments are required to monitor and report on any accountable action undertaken after the baseline date of 1 January 1988. The MDBC is coordinating the development of the Basin Irrigation and Salinity Mapping Project, using a geographical information system (GIS) approach, to monitor, record and report significant changes to irrigation practice since the baseline date. These include changes to irrigated land use, drainage infrastructure, groundwater pumps and evaporation basins. The second edition of the atlas depicting this data was released in August 2002 and was circulated widely to MDBC working groups and other interested individuals in partner governments, seeking their feedback. A revised edition of the atlas, taking account of the feedback, is planned for September 2003.

Clause 46 of the *Agreement* requires assessment of any proposal that may have a significant effect on River Murray flow, use, control or quality. The Cap is closely associated with Clause 46. The Water Policy Committee requested the MDBC to assess the impacts of farm dams in relation to the Cap. A number of datasets relating to catchment studies of farm dams in the Basin were compiled and preliminary assessments were made of total numbers, capacity and trends. The data indicate that farm dams significantly reduce stream flow and can contribute towards significantly increased downstream salinity. Further data on farm dams are required to refine the assessments.
River Murray Mapping provides detailed, accurate and reliable data and tools that assist in the assessment of impact of proposals on the River Murray floodplain. To keep information up-to-date, River Murray Mapping is repeated and updated every five years. The first and second editions were carried out in 1991 and 1996 respectively. A third edition was scheduled for 2001/02 but it was suspended pending the definition of the knowledge requirements needed to support the River Murray Environmental Manager function. Funds for a third edition have been allocated for 2004/05.

**Water resource operations advice**

Existing modelling capabilities of the MDBC continue to be used to provide a range of forecast information to aid RMW operations and to inform partner governments and the wider community.

- The Flow and Salinity Model is used to provide forecasts for up to six weeks of water flow and salinity levels for the River Murray system from Hume Reservoir to the barrages. Weekly updates are distributed directly to stakeholders and via the MDBC website.

- The Accounts Model uses recorded flow and diversion data to calculate the States’ shares of available water.

- The Assessment Model is used to assess the water available to the States for the next two seasons under a range of future inflow conditions. The available water if the minimum historical inflow sequence was repeated is generally used by the partner governments to inform their allocation announcements.

- The Multi-history Model is used to determine the probability of certain events occurring over the next one to five years. Model runs commence at the current settings and project into the future using the full range of climatic sequences experienced over the last 109 years.

- Scenario Modelling is also undertaken to inform the decision-making process. Such modelling provides information on the impacts of proposed policy initiatives based on how they would have performed over the climatic sequence observed over the last 109 years. Significant modelling projects currently under way include The Living Murray and Water Trade.

Resources related to the modelling systems are used to produce the data provided in the RMW *Weekly Report*. This includes summary data regarding the River Murray and its tributaries from the Snowy Mountains to the Murray Mouth. RMW has received very positive feedback from stakeholders regarding the report in 2002/03, and its distribution has increased markedly this year.
The extreme dry conditions in 2002/03 increased the demand for modelled information generally and ensured a continued review of the assumptions made in the forecast models. The models proved to be robust, though the minimum inflow sequences will need to be updated to incorporate those experienced in 2002/03. The Assessment Model may also be revised to incorporate persistence (where future inflow sequences are adjusted according to recently observed inflows).

**River Murray model development**

In July 2000, the MDBC agreed that it would adopt the New South Wales Government’s integrated quantity and quality (IQQM) modelling package as the basis for future model development. However, the expected timeframe for this development meant that it would not be able to provide information in the short term for The Living Murray or BSMS. As an interim arrangement, the MDBC’s existing monthly simulation model (MSM) and its daily forecasting model (BIGMOD) were linked to provide 109 years of daily flow output for The Living Murray and 25 years of daily salinity output for the BSMS.

The MSM-BIGMOD package was reviewed by an independent auditor to determine its suitability for use under the BSMS. Following this successful review, MSM-BIGMOD was approved by the MDBC under Clause 38 (3) of Schedule C, as an appropriate model to simulate the salinity, salt load and flow regime.

The MSM-BIGMOD package was also used successfully to assess options for The Living Murray project. Daily outputs from the model for a number of scenarios have been input to the Murray Flow Assessment Tool which is being developed under The Living Murray to assess the environmental impacts of different flow regimes.

Improvements have also been made this year to the framework under which the models operate. A new front end, that operates on a Windows environment has been developed. It streamlines model operation, facilitates the analysis of results and archives model statistical output on a data base.
Statutory referrals

The MDBC receives a number of statutory referrals submitted for consideration (Table 11). All contracting governments must, under Clause 46 of the Agreement, ensure the MDBC is informed of significant proposals that may affect the flow, use, control or quality of the River Murray. As a result of this provision, New South Wales created the *Murray Regional Environmental Plan No 2* (REP2). As a statutory document, it requires planning and development proposals located on the River Murray floodplain as defined by REP2 to be referred to the MDBC.

**Table 11. Statutory referrals for 2002/03.**

<table>
<thead>
<tr>
<th>Number of referrals</th>
<th>166</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average time to respond (days)</td>
<td>16</td>
</tr>
</tbody>
</table>

New South Wales is undergoing a regional planning reform, that may result in changes to REP2 and the current referral process.

The *Floodplain Management Strategy* approved by the Ministerial Council in August 2002 includes a number of recommendations regarding the MDBC’s role in floodplain planning that includes, assessment of significant floodplain development proposals as well as monitoring of the cumulative impact of developments on the floodplain.

KPA 6 *Land and Water Management Plan*—**water entitlement and efficiency of use**

Performance assessments and achievements

Maintenance of existing balance between environmental and consumptive uses of water (the Cap)

The MDBC has taken a range of measures to preserve the existing balance between consumptive and environmental use of water resources in the Basin. The aim is to promote the health of the river system and enhance the efficiency of water use. These measures include introduction of the Cap, the Sustainable Rivers Audit (SRA) and permanent interstate water trading. In 1995, the Ministerial Council decided to cap diversions in the Basin (see box). This decision was one of the most important initiatives ever undertaken by the Ministerial Council.

**2001/02 Audit of the Cap**

As directed by the Ministerial Council, the Independent Audit Group (IAG) conducted the annual review of Cap implementation over the period October 2002 to February 2003. It reported to the MDBC in March 2003.
The Cap is the balance struck by the Ministerial Council between the significant economic and social benefits that have been obtained from the development of the Basin’s water resources on the one hand, and the environmental uses of water in the rivers on the other.

By limiting future growth in consumptive water use, the Cap promotes the sustainable use of the Basin’s resources by:

- preserving the existing security of supply for river valleys;
- helping maintain water quality;
- encouraging the efficient use of water and thereby reducing waterlogging and land salinisation; and
- preventing further deterioration of the flow regime for the environment.

In most of the Basin, the Cap will limit future water use to the volume of water that would have been diverted under 1993/94 levels of development. Targets for each State are approved by the Ministerial Council. Once targets are set, each State is responsible for implementation within its own jurisdiction, allowing them to take account of local circumstances.

It is important to understand what is meant by 1993/94 levels of development. It does not mean the volume of water that was used in 1993/94. Rather, the Cap in any year is the volume of water that would have been used with the infrastructure and rules (e.g. pumps, dams, channels, areas developed for irrigation, management rules) that existed in 1993/94, assuming similar climatic and hydrologic conditions to those experienced in the year in question. For example, to establish the Cap target in the 2001/02 water year, computer models are used to calculate the diversion that would have occurred under the climatic sequence experienced in 2001/02, if 1993/94 management rules and infrastructure were still in place.

Thus, the Cap provides scope for greater water use in certain years and lower use in other years. The Cap itself does not attempt to reduce Basin diversions, merely prevent them from increasing. New developments are possible under the Cap provided the water for them is obtained by improving water use efficiency or by purchasing water from existing developments.

In each State, the key tasks are to:

- define and monitor all diversions;
- detail the Cap development conditions in each river valley;
- develop and calibrate the computer models that will be used to calculate the Cap target in each river valley at the end of each season;
- obtain MDBC endorsement that the calibrated river valley models are fair and accurate representations of the approved Cap;
- streamline the processes for collecting and collating diversion data and producing annual reports; and
- adjust water allocation rules to ensure that diversions stay within the Cap in all designated river valleys.
KEY IAG CONCLUSIONS AND RECOMMENDATIONS

South Australia

- Diversions in all Cap valleys were within the Cap.

Victoria

- Diversions for Cap valleys were within acceptable bounds for Cap management.

New South Wales

- Diversions in the Lachlan and Gwydir Cap valleys exceeded long-term Cap estimates.
- An assessment of Cap compliance for the New South Wales Border Rivers was not possible because the Cap had not been defined in that valley.
- Diversions were within acceptable bounds for Cap management in the remainder of New South Wales.
- New South Wales officials reported to the Ministerial Council meeting in May 2003, on the underlying reasons for excessive diversions of Lachlan and Gwydir including management actions proposed to bring diversions within Cap limits. Ministerial Council requested the NSW Minister to report again on Gwydir cap management at its November 2003 meeting.

Queensland

- Growth in off-stream storages has been minimal following the moratorium on construction since 1999/2000.
- Draft water resource plans were released for the Paroo/Warrego/Nebine, Border Rivers and Moonie. Public comments closed on 31 October 2002.
- The IAG reviewed the plans and considers that the proposals for the Paroo/Warrego/Nebine met the audit criteria; the proposals for the Moonie and Border Rivers did not meet the precautionary principle and would result in further growth in diversions and possible adverse downstream impacts. In the case of the Border Rivers the IAG recommended that the long-term flow targets be set to the greater of the flows at November 1999 conditions or 60% of predevelopment flow.

Australian Capital Territory

- Priority needs to be given by the Ministerial Council to the resolution of the trading rules across the Basin.
- Once the trading rules are agreed for the Basin to the satisfaction of the Australian Capital Territory, consideration needs to be given to an average long-term Cap for the Australian Capital Territory of 38 GL/year which should be fully transferable.
An independent auditor conducted the technical audit of four Cap models—two from Victoria and one each from New South Wales and South Australia as a part of accreditation of Cap models by the MDBC. After being recommended by the independent auditor, the Lachlan IQQM Cap model was approved by the MDBC under the Schedule F provisions, the first model across the Basin to achieve this milestone. Other Cap models are expected be audited and approved during 2003/04 to 2004/05.

**Progress towards a water use balance which better meets the environmental needs of rivers**

The Sustainable Rivers Audit (SRA) is an assessment and reporting tool developed by the MDBC and its partner governments to assess the health of Basin rivers. Indicators and methods that are robust and consistent across catchments and over time have been developed for river health assessment. A decision on the future of the SRA will be made in November 2003. Further details on the SRA appear elsewhere in this report.

The picture of river health provided by the SRA reports will be at a broad river valley scale and if implemented will be regularly re-assessed and reported across the Basin. The indicators and trends from those reports will inform the Ministerial Council of the big picture of river health and will assist them in making decisions affecting the management of land and water resources of the Basin.

**Permanent interstate water trading achieved progressively across the Basin**

The very dry conditions across the southern part of the Basin in 2002/03 highlighted the importance of water trade to water users’ ability to adjust to reduced water availability and to maximise the returns gained from available water. The MDBC’s Interstate Water Trading Pilot enabled permanent trades across the three State borders in the mallee zone. Since inception in August 1998, the net volumes traded out of New South Wales and Victoria are 5938 ML and 8374.6 ML respectively, with an equivalent net volume of 14,512.6 ML traded into South Australia. In addition, activity on temporary markets within and between States was very high. Details of this activity were reported in *Chapter 3*.

Work was completed on requirements to enhance permanent interstate trade, including:

- specifying the volume, reliability and tenure of all the major water access rights likely to be tradeable across the southern Basin;
- describing current trading rules across the southern Basin and developing principles for interstate trading rules;
- identifying key barriers to trade between irrigation districts;
- determining principles for the application of bulk water charges; and
identifying potential mechanisms and transfer procedures for water access rights of differing reliability and tenure.

A tool to assess the potential salinity impacts of new irrigation development will be completed early in 2003/04. Modelling of the riverine environmental impacts of water trade was completed and found that there were no measurable impacts from water trade.

Commitment to enhancement of permanent interstate trade was strengthened. The Ministerial Council directed the MDBC on key tasks to enhance trade including:

- establishing mechanisms for trade between water access rights of different reliability and tenure;
- establishing zones and rules for interstate trade across the southern Basin;
- recommending ways of removing barriers to trade out of irrigation districts and provide mechanisms to deal with financial and asset management impacts; and
- ensuring the legal validity of trade.

The Ministerial Council identified key requirements for effective and expanded permanent trading markets including:

- clear specification by governments of water access entitlements including duration of tenure and arrangements under which tenure may be modified;
- clear registration of water access entitlements by governments for individuals to hold, use and trade permanently between zones, valleys and States;
- removal of current administrative barriers that limit access to permanent interstate water markets in water access entitlements; and
- agreement between States with respect to the environmental clearance requirements for new irrigation developments.

The Ministerial Council will consider the prospects for commencement of an expanded market at its November 2003 meeting.

**Information management system in place that enables reporting on irrigation water use efficiency**

Development of a framework for the irrigation management information and reporting system (IMIRS) commenced in April 2001. The system will facilitate access to the most recent and complete irrigation data available for the Basin. The IMIRS will build on current data collection networks and will provide a framework for stakeholders and data collectors so that consistent, repeatable and reliable irrigation data will be collected in the future.
The initial outputs of this project included:

- a compilation of readily available data for the irrigation theme of the National Land and Water Resources Audit;
- development of the first overview report on irrigation information in the Basin with particular emphasis on an analysis of data limitations and information gaps; and
- a recommended draft irrigation information and reporting framework to support the collection, reporting and storage of consistent, repeatable and comparable data across the Basin to be tested through Basin-wide case studies.

Four case studies have been initiated across the Basin in order to cover a range of catchment organisations, State and water agency jurisdictions, industries, and locations. The principal aim of the case studies is to test and refine the draft framework for future application across the Basin. The framework includes four generic elements:

- an information framework;
- an organisational structure;
- technical architecture; and
- a cultural change initiative.

To date, two case studies have been completed. One was a catchment-based approach involving the Goulburn–Broken catchment in Victoria and the other was an industry-based approach in partnership with the cotton industry. Two other case studies have commenced:

- one based on the Riverland West Local Action Plan area in South Australia; and
- the other, with the cooperation of Border Rivers Food and Fibre, across the Border Rivers region of Queensland and New South Wales.

Preliminary findings from the first two case studies show strong support for improved irrigation management information and reporting in the three key areas of water availability, managing impacts resulting from irrigation and best use of water. There is generally relatively little correlation between existing reporting and the priority reporting areas identified during the case studies, with most existing reporting driven by statutory or regulatory requirements, or obligations to satisfy the reporting requirements of funding agencies.

Results from the case studies suggest that redirection of the current investment in information management would lead to significantly improved access to better quality information, at least at a regional level, to underpin future policy and irrigation management. Following completion of all the case studies, an assessment will be made of the benefits of applying the framework across the Basin in a consistent manner.
River Murray Environmental Manager

The River Murray Environmental Manager function (RMEM) was established in March 2001 by the Ministerial Council to contribute to the MDBC’s responsibility to efficiently manage, conserve and enhance the resources of the Basin.

The responsibilities and programs within the RMEM during 2002/03 included:

- the Living Murray Implementation Program;
- knowledge development;
- Barmah–Millewa Forum; and
- floodplain planning.

The Living Murray Implementation Program is the Ministerial Council’s $150 million, seven-year program of structural and operational measures (see Section 4.4).

The RMEM supported a number of knowledge generation projects including:

- *Environmental Implications of Drought for Management of the River Murray System*—report of a workshop conducted by the MDBC, Canberra, December 2002; and
- *Preliminary Investigation into Observed River Red Gum Decline along the River Murray below Euston*—report prepared for the RMEM, MDBC, March 2003, Technical report 03/03.

The drought workshop and subsequent report were undertaken in response to the poor water resource conditions in the River Murray system during 2002/03.

The report on red gums led to the conclusion that there is evidence of a significant decline in river red gum populations below Euston and that ... unless *an adequate flooding regime is reintroduced in the near future, it is likely that a significant loss of vegetation communities on the lower River Murray floodplain will occur* (MDBC 2002).

Other activities of the RMEM included contributions to the administration of the Barmah–Millewa Forum and actions on floodplain planning.

The RMEM invested considerable effort in expanding its role and developing its capacity to:

- work with RMW to seek opportunities for improving the environmental outcomes of operation of the River Murray system; and
- develop the institutional form of the RMEM.
The RMEM has now been established as a separate business unit under the Natural Resources Management Branch of the MDBC. Its roles and responsibilities, especially with regard to management of environmental water allocations, will be developed further in 2003/04 through advice from the MDBC and the Ministerial Council.

**KPA 6 Land and water management—water quality and flow management**

**The Living Murray initiative**

In 2002, Ministerial Council established The Living Murray initiative as a further development of the previous Environmental Flows Project and agreed (Meeting 33, 9 May 2003) that The Living Murray initiative should be underpinned by a clear and consistent set of operating principles and agreed to the following higher level principles.

The Living Murray initiative was adapted and refined in significant ways during 2002/03 as a result of key Council decisions, direction from the Commission, reports from the Independent Community Engagement Panel (ICEP), and advice from the Community Advisory Committee, and three reference panels. Specifically, the key phases of activity were:

- triple bottom line analyses against three reference points (350, 750 and 1500 GL/year) conducted from July 2002;
- studies on water recovery mechanisms and opportunities for improving sustainability of irrigation industries and regions, initiated from November 2002;
- commencement of integrated analyses on water recovery, environmental management, ecological responses, economic benefits and costs, and social impacts, conducted from May 2003;
- initial development of worked examples on how river environmental management would deliver a ‘first step decision’ on environmental water allocation, drawing on investment in ecologically targeted works and separating rules; and
- Community engagement was phased to accommodate as best as possible the availability of this information.

**OPERATING PRINCIPLES: LIVING MURRAY INITIATIVE**

- Action will be taken to achieve a healthy river system.
- Action taken will be fair and reasonable.
- A range of measures will be used in an integrated and adaptive manner.
- There will be both government and community responsibilities for The Living Murray decisions and outcomes.
In summary, the MDBC has contributed to The Living Murray initiative significant, high quality scientific, economic, social advice supplemented with practical operational experience. It is expected that this advice will enable a decision by Ministerial Council on a ‘first step’ proposal towards a healthy working River Murray. The First Step proposal will take into account the knowledge available at the time but will not be restricted to a choice between the three reference points.

Community engagement, consultation and information proved to be challenging, and there was continual change in the conduct of this activity for several reasons:

- absence of an agreed policy position on government’s preparedness to invest in water recovery contributed to perceived high uncertainty for irrigators;
- the evidence from earlier studies that the River Murray was in declining health, and warranted action, was not universally accepted; and
- the work of the MDBC had not progressed to the point where potential impacts on regions and local areas could be estimated.

Nevertheless, a major campaign was conducted, and was subjected to observation and reporting by ICEP. It will be evaluated in 2003/04.

As part of the evolution and change in The Living Murray initiative in 2002/03, a revised management structure was put in place. This involved a revised project board, appointing General Manager Natural Resources as the project director, and drawing together a wider scope of work under common management.

The major streams of work undertaken through The Living Murray initiative included:

- community consultation, leading to community engagement following a ‘first step’ proposal;
- scientific research, modelling of hydrology and ecological factors;
- social and economic impact assessments;
- water recovery mechanisms that are achievable and efficient;
- facilitation of intergovernmental processes to establish water trading arrangements, an environmental water account and supporting institutions; and
- planning for implementation of works and measures identified under the investment plan agreed in 2002.
Performance assessments and achievements

Achievement of water quality outcomes of the Salinity and Drainage Strategy

Salinity levels 2002/03

Salinity levels in the River Murray during the 2002/03 drought were lower than the long-term average as a result of several factors including:

- the source of the water;
- South Australia receiving full entitlement flow; and
- the reduction in saline inflows due to the drought.

As a result of low inflows and low water levels in Menindee Lakes and Lake Victoria during the 2002/03 season, most flows along the River Murray were sourced from Dartmouth Reservoir, which holds some of the freshest water in the River Murray system. In addition, South Australia received its full entitlement flow of 1850 GL, thus ensuring adequate dilution of saline groundwater inputs.

This situation was in contrast to other drought periods such as 1982/83 where flows were sourced from more saline storages including Menindee Lakes and Lake Victoria, and 1967/68 when South Australia experienced a reduction in its entitlement flows due to low resource availability.

In addition to these factors, the dry conditions across the Basin in 2002/03 contributed to a reduction in saline inputs from groundwater and irrigation return flows.

While South Australia received its full entitlement flow in 2002/03, without good rainfall throughout the catchment and an increase in resource availability for 2003/04, flows may be cut and this would be expected to result in increased salinity levels along lower reaches of the River Murray.

With the release of the BSMS, the contracting governments of New South Wales, Victoria and South Australia have been focusing on developing their capacities to deliver not only the required joint works program but also the State in-valley works.

The BSMS has been embodied in the Agreement, in the form of a revised Schedule C to the agreement that was agreed to by the Ministerial Council in November 2002. Schedule C authorises the MDBC to make any protocols that it considers necessary to give effect to the schedule.

In June 2003, the MDBC approved the BSMS Operational Protocols Version 1.0 as appropriate for implementing Schedule C.

In accordance with Schedule C and as stated in the Operational Protocols, a program of joint works and measures has been established to offset the predicted future increase on the average salinity at Morgan, arising from
accountable actions and delayed salinity impacts, by a total of 61 EC by December 2007.

Additional detail on salt interception schemes is outlined in KPA 2.

Strategies in place to protect future water quality in the Basin’s rivers

**Basin Salinity Management Strategy 2001–2015**

The *Basin Salinity Management Strategy 2001–2015* guides communities and governments in working together to monitor and control salinity and protect key natural resources values within their catchments, consistent with the principles of the ICM Policy. It establishes targets for river salinity in each tributary valley and the Murray–Darling system itself. These targets reflect the shared responsibility for action both between valley communities and between States. It provides a stable and accountable framework that, over time, will generate confidence in progress of joint efforts to manage salinity.

The BSMS provides a comprehensive, strategic and well thought out approach to a most challenging environmental issue facing the Basin and the nation.

Under the BSMS, partner governments have committed to the following elements of strategic action, to be implemented over the next 15 years:

- developing capacity to implement the BSMS;
- identifying values and assets at risk;
- setting salinity targets;
- managing trade-offs with the available within-valley options;
- implementing salinity and catchment management plans;
- redesigning farming systems;
- targeting reforestation and vegetation management;
- constructing salt interception works; and
- ensuring Basin-wide accountability through monitoring, evaluating and reporting.

As part of this action, the MDBC will:

- manage a comprehensive knowledge-generation program;
- coordinate and enhance further research and development on farming systems;
- further investigate targeted revegetation for salinity outcomes;
- construct and operate salt interception schemes; and
- establish Basin-wide monitoring, evaluation and reporting arrangements.

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**Natural resources business**
Implementing the Basin Salinity Management Strategy: key highlights of 2002/03

Key salinity strategy achievements

- Operational Protocols to Schedule C approved by MDBC as appropriate for implementing Schedule C.
- Ministerial Council approval of the public release of the inaugural 2001/02 BSMS Implementation Report.

Investment in knowledge generation and tools

- Further development of tools for assessing the salinity impacts of water trade.
- Tributary salinity and flow modelling.
- Updated and accredited MDBC Model; MSM BIGMOD.
- A second ‘salinity modelling’ forum was held in June 2003.

The key responsibilities of the MDBC in delivering the BSMS lie within the implementation of the strategy. They include:

- salinity and salt load target setting;
- knowledge generation;
- joint works program; and
- reporting and accountability arrangements.

The key achievements of the MDBC throughout 2002/03 are detailed according to these key themes.

BSMS OBJECTIVES

- To maintain the water quality of the shared water resources of the Murray and Darling Rivers for all beneficial uses—river salinity at Morgan, South Australia, will be maintained at less than 800 EC for 95% of the time.
- To control the rise in salt loads in all tributary rivers of the Basin, and through that control, protect their water resources and aquatic ecosystems at agreed levels—meeting the end-of-valley targets.
- To control land degradation and protect important terrestrial ecosystems, productive farm land, cultural heritage and built infrastructure at agreed levels Basin-wide—expressed as within-valley targets.
- To maximise net benefits from salinity control across the Basin.
Developing capacity to implement the BSMS

1. BSMS Implementation Working Group

The MDBC established the BSMS Implementation Working Group (BSMSIWG) to oversee the implementation of the BSMS in November 2001. The BSMSIWG is composed of representatives of all partner governments and the CAC, with technical and administrative support provided by the MDBC Office. The BSMSIWG met six times during 2002/03, initiating a range of activities to ensure effective implementation of the BSMS.

2. Revising Schedule C to the Agreement

Prior to 2002/03, Schedule C of the Agreement specified the statutory requirements of the 1989 Salinity and Drainage (S&D) Strategy, including arrangements for an initial program of joint salt interception schemes, operation of a register of Morgan salinity credits and debits, and capacity for reporting and accountability.

As the BSMS replaces the S&D Strategy, Schedule C was revised to give effect to its key elements, while still preserving the achievements of the S&D Strategy. The development of the new Schedule C involved detailed consultation with partner governments and coordination with the BSMSIWG and the High Level Working Group on Salt Interception.

The revised Schedule C to the Agreement was adopted by the Ministerial Council at Meeting 32 in November 2002.

3. Developing baseline conditions

The Baseline Conditions Technical Subcommittee (BCTS) was established to determine the baseline conditions for the BSMS and assessment criteria for the river and tributary models. The BCTS has undertaken a number of major tasks during 2002/03, including:

- assessment criteria for the MSM BIGMOD and Tributary models; and
- assessment and provision of a set of recommendations for the River Murray MSM-BIGMOD model and interim baseline conditions.

The MDBC meeting of 4 March 2003 deferred approval of the baseline conditions for the River Murray at Morgan until after the provision of updated estimates of baseline conditions of the tributary valleys by contracting governments. These are due to be finalised by 31 March 2004, in accordance with Schedule C.

4. Developing salinity modelling and assessment frameworks

To support a rigorous and timely reporting process to the Ministerial Council, the States and the MDBC are developing hydrologic and salt mobilisation models to allow assessment of accountable actions against agreed baseline conditions.
Tributary models are being developed in New South Wales and Queensland using the IQQM, while in Victoria the REALM (resource allocation model) is being used. For the upper River Murray and the River Murray in South Australia the BIGMOD model has been developed as an interim measure prior to the implementation of IQQM. All models are being established according to agreed criteria including the baseline conditions at 1 January 2000 and using the benchmark climate sequence from 1 May 1975 to 30 April 2000.

The BCTS has developed agreed criteria documented in the protocols to Schedule C, with which the tributary and flow models will be assessed by November 2003. It is anticipated that these models will be submitted to the MDBC by March 2004, in accordance with the requirements of Schedule C for model accreditation. The outcomes of these models and their associated documentation will support the determination of the baseline conditions that underpin the accountability arrangements of the BSMS.

5. Salinity modelling forum

Following the success of the first salinity modelling forum, and circulation of the proceedings on CD to forum participants in September 2002, the BSMSIWG hosted a second salinity modelling forum in June 2003. This provided an opportunity for each jurisdiction to build on 2001/02 discussions and communicate key issues and outcomes of their salinity modelling techniques to other key modellers.

The outcomes of the workshop included:

- a better appreciation of modelling approaches and limitations within each jurisdiction;
- sharing of methodologies and information; and
- a network for key salinity modelling practitioners.

The informative workshop presentations are being compiled on CD for circulation to participants in September 2003.

Setting salinity targets

1. Finalising end-of-valley salinity and salt load targets

The jurisdictions are currently finalising end-of-valley targets in consultation with catchment communities, as part of the development of ICM plans for each valley. The end-of-valley targets are expected to be finalised by March 2004.
2. Reviewing the end-of-valley monitoring framework

To assist in the complex process of ongoing assessment of progress towards end-of-valley targets, partner governments committed to establishing a monitoring network for collecting continuous flow and salinity data to agreed standards. Throughout the year, State governments have ensured that continuous flow and salinity monitoring stations are installed at all end-of-valley target locations in accordance with the recommendations from the End-of-Valley Hydrographic Review, undertaken by Ecowise Environmental. The final report and recommendations of the hydrographic review were tabled at the BSMSIWG in July 2002. The recommended minimum standards for monitoring of this report have also been included in the protocols to Schedule C.

Targeted reforestation and vegetation management

In September 2002, the MDBC agreed that because of similar developments being explored by governments, development of the vegetation bank concept was to be deferred. It recognised the added value of the knowledge generated through the project, and agreed it be made accessible to national and Basin interests. It also agreed to keep a watching brief on further developments over the next few years.

As a consequence, the project (now called Targeted Vegetation Management) has focused on developing a better understanding of the potential for targeted revegetation and improved management of existing (remnant) native vegetation to contribute significantly to mitigating dryland salinity and to provide a range of other ecosystem services.

The project has used various tools and techniques to identify priority areas for revegetation at a range of scales. It involves collaboration with partner governments and various research and development (R&D) organisations to ensure the integration of the best new and current knowledge and methods to underpin decision making, with the objective of optimising the contribution that targeted vegetation management can make to sustainable land management in the Murray–Darling Basin.

Constructing salt interception works

1. Transitional arrangements—completing the S&D Strategy

Since 1989, the S&D Strategy has provided a framework for joint action by the New South Wales, Victorian, South Australian and Australian governments to effectively manage the problems of waterlogging and land salinisation in the irrigation districts of the Murray Valley in New South Wales and Victoria, and river salinity in the lower River Murray. The strategy is based on a balance between engineering (interception schemes that divert saline groundwater that would otherwise flow into the river) and non-engineering (land and water management) solutions that tackle both
river salinity and land salinisation. Under the *S&D Strategy*, no State is to construct works or approve any proposal that will have an adverse impact on the salinity of the River Murray unless it has previously earned ‘salinity credits’ by contributing to salinity mitigation works.

The MDBC maintains a register to account for the salinity credits and debits resulting from projects that increase or decrease river salinity under the *S&D Strategy*. The ‘credits’ are associated with salt interception schemes (funded by South Australia, Victoria and New South Wales, and the Australian Government). ‘Debits’ result from activities by the States (New South Wales, Victoria and South Australia) such as construction of irrigation drains, groundwater pumps, new irrigation development and wetland flushing. The register is also used to record changes to operational policies and works that have an impact on river salinity. The effect of actions detailed on the register are summarised in Table 12.


One of the key outstanding issues from the *S&D Strategy* that requires resolution under the BSMS is the inclusion of South Australia in the MDBC A Register, with South Australia to offset the salinity impact of post-1 January 1988 developments by December 2002.

South Australia tabled a final report assessing the impacts of post-1988 actions including new irrigation development, improved irrigation practice and upgraded irrigation and drainage infrastructure to the MDBC meeting in September 2002 and the November 2002 Ministerial Council meeting.

<table>
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<tr>
<th>Component</th>
<th>New South Wales (µS/cm)</th>
<th>South Australia (µS/cm)</th>
<th>Victoria (µS/cm)</th>
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<td>Accountable actions</td>
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Current balance (available credits) 5.13 TBA# 1.63

Figures current at June 2002.

All figures shown are ‘equivalent EC’ at Morgan.

* Allocated EC Credits – of these 11.1 have been taken up, the remaining 5.7 have not been used.

# South Australia is currently undertaking studies to confirm its post-1988 accountability.

The S&D Register is to be incorporated in the BSMS A Register.
It is anticipated that the MDBC A Register will be updated no later than July 2004 to reflect the net impact of South Australian actions post-1988, in accordance with MDBC and Ministerial Council recommendations. In the meantime, it has been noted in the MDBC A Register that the salinity impact of post-1988 actions in South Australia are yet to be finalised.

**Ensuring Basin-wide accountability—monitoring, evaluating and reporting**

1. *Salinity impacts of interstate water trade and new irrigation development*

Following decisions of the Pilot Interstate Water Trading Board & Water Market Reform Working Group and the MDBC, a project has been initiated to develop a salinity impact rapid assessment tool (SIMRAT) for the assessment of the salinity impacts of interstate water trade for irrigation. Although Stage 1 of the project developed a spreadsheet model, when submitted to the BSMSIWG, it was not accepted as ‘fit for purpose’. Accordingly a second stage is under way to provide a spatially based approach that builds on the developments in South Australia of the SIMPACT model.

A consultancy consortium was selected to undertake the project in November 2002. An inter-jurisdictional project steering committee has been overseeing the project. The project is now approaching its conclusion and final report stages. It is anticipated that the model will be endorsed as ‘fit for purpose’ under the MDBC’s BSMS Schedule C arrangements.

2. *Reporting and accountability arrangements*

A key feature of the BSMS is the agreement to basin-wide accountability and reporting arrangements, with partner governments committing to annual reporting using end-of-valley report cards and MDBC A & B salinity registers.

The 2001/02 BSMS annual implementation report was based on the four BSMS objectives, with an emphasis on measurable outcomes where possible, but recognising that in many instances it will only be possible to report progress with interventions (inputs and outputs) and modelled outcome predictions. The report also includes detailed accountability reporting using the end-of-valley report cards and the A & B registers.

The BSMSIWG prepared the inaugural *BSMS Implementation Report for 2001/02*. It was approved for public release by the Ministerial Council in May 2003.
1. Salinity and Drainage Strategy Register


<table>
<thead>
<tr>
<th>COMMISSION REGISTER A</th>
<th>Type</th>
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<th>Provisional Salinity Effect</th>
<th>Salinity effect (EC at Morgan)</th>
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<td>Pyramid Creek</td>
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**STATE WORKS & MEASURES**

**New South Wales**

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**New South Wales Subtotal** | NSW | 7.4 | 7.4 | 7.4 | 7.4 | 7.4 |

**Victoria**

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<td>Goulburn-Broken</td>
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<td>Sunraysia drains drying up</td>
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**Victoria Subtotal** | Vic | 4.1 | 4.1 | 4.1 | 4.1 | 11.2 |
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<th>Vic</th>
<th>SA</th>
<th>Qld</th>
<th>Total</th>
<th>Salinity Credits/Debits (30 Year Average Equivalent EC)</th>
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-681 | 687 | -8.5 | -8.5 |

-411 | -411 | 411 | -5.1 | -5.1 | 2000 | 2003 | In progress |
-323 | -323 | -323 | 4.0 | 4.0 | 2000 | 2005 | – |
-60  | -60  | -60  | 0.7 | 0.7 | 2000 | 2005 | – |
-16  | -16  | -16  | 0.2 | 0.2 | 2000 | 2005 | – |
TBA  | TBA  | TBA  | TBA | TBA | TBA | TBA | TBA |
-899 | 839 | -11.2 | -11.2 |
Table 13. Basin salinity registers continued.

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| COMMISSION REGISTER B     |               |                |                             |              |      |      |      |                 |
| New South Wales           |               |                |                             |              |      |      |      |                 |
| Namoi                     | Delayed       | 1999           | 1.3                         | 6.4          | 21.3 | 42.7 |       |                 |
| Macquarie                 | Delayed       | 1999           | 0.9                         | 4.3          | 14.3 | 28.7 |       |                 |
| Gwyder                    | Delayed       | 1999           | 0.02                        | 0.1          | 0.3  | 0.7  |       |                 |
| Border Rivers             | Delayed       | 1999           | 0.02                        | 0.1          | 0.3  | 0.7  |       |                 |
| Murrumbidgee              | Delayed       | 1999           | 1.2                         | 6.0          | 20.0 | 40.0 |       |                 |
| Bogan                     | Delayed       | 1999           | 0.6                         | 3.2          | 10.7 | 21.3 |       |                 |
| Castleraugh               | Delayed       | 1999           | 0.0                         | 0.2          | 0.7  | 1.3  |       |                 |
| Victoria                  |               |                |                             |              |      |      |      |                 |
| Goulburn                  | Delayed       | 1999           | 0.2                         | 0.8          | 2.7  | 5.3  |       |                 |
| Loddon                    | Delayed       | 1999           | 0.1                         | 0.7          | 2.3  | 4.7  |       |                 |
| Vic Mallee                | Delayed       | 1999           | 3.0                         | 15.0         | 50   | 100  |       |                 |
| South Australia           |               |                |                             |              |      |      |      |                 |
| SA Mallee                 | Delayed       | 1999           | 10.0                        | 50.0         | 167  | 333  |       |                 |
| Queensland                |               |                |                             |              |      |      |      |                 |
| Condamine Ballone         | Delayed       | 2000           | 0.10                        | 0.5          | 1.7  | 3.3  |       |                 |
| Border Rivers             | Delayed       | 1999           | 0.10                        | 0.5          | 1.7  | 3.3  |       |                 |
| Irrigation development pre 1 January 2000 | Delayed | 2000           | 0.10                        | 0.5          | 1.7  | 3.3  |       |                 |
| Balance - Register B      |               |                |                             |              |      |      |      |                 |
| Balance - Registers A & B |               |                |                             |              |      |      |      |                 |

Registers Explanatory Notes
- TBA - To be assessed
- Victorian administrative areas revised June 2003
- Credits shown as positive numbers, debits shown as negative numbers
- Salinity Effect - Increase in average salinity at Morgan in EC
- Salinity Cost Effect - Increase in average salinity costs in $'000s (March 1988 values)
- Figures rounded to one decimal place.

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Registers Explanatory Notes (continued)

Salinity Credits - Unit of account of Salinity and Drainage Strategy (≡ negative of salinity cost effect)
Equivalent EC - Salinity credits (in $) expressed in EC units using the ratio of total $ credits to total Salinity Effect for the initial joint works.
Register B - Contributions to Morgan salinity in 2015 (assuming no intervention) as predicted in the 1999 Salinity Audit (see Table 1 in Basin Salinity Management Strategy 2001–2015)
Register is Transitional from Salinity and Drainage Register (All items to be recalculated using MSMS BIGMOD (to be finalised March 04) and new cost Functions (to be finalised by September 2004)
Landscape and groundwater knowledge

Investment and management of knowledge generation through the Dryland Program contributes to each of the four goals of the ICM Policy Statement. The program is also responsible for the management, coordination and communication of knowledge to deliver BSMS outcomes in redesigned farming systems for dryland regions.

In redesigning farming systems, it is necessary to identify where current farming practice is sustainable and where new systems are required. The Landmark Project is applying a spatially explicit triple bottom line test of sustainability across three dryland pilot regions of the Basin: Goulburn–Broken, Condamine and Billabong. The triple bottom line analysis was completed for the Goulburn–Broken in 2002/03. Analysis of the Condamine and Billabong regions is ongoing.

A key output of the program has been the development of the Biophysical Capacity to Change (BC2C) model. The model uses the groundwater flow system framework and links changes in land use to changes in streamflow and salt load. The model also accounts for the likely response times and lags between land use change and catchment response.

The program has also produced a number of publications in the MDBC’s new knowledge series of publications.

- *Settlement, erosion and muddy waters: lessons from the past* provides a historical overview of how settlement and agricultural development have changed the landscape of the Basin over the past 200 years. The report is one output produced by a larger project that mapped sediment and nutrient exports in dryland regions across the Basin. The project developed improved techniques to budget for sediment and nutrient generation and transport. Application of the techniques indicates that typically 50–80% of material exported to the end of a river valley comes from only 20% of the catchment area. These results highlight the importance of a sound knowledge base to target landscape intervention in order to achieve the most efficient outcome.

- *Groundwater Models: a community guide to better understanding* has been specifically designed for catchment communities and natural resources managers as a guide to understanding and developing groundwater models.

- *Projections of groundwater extraction rates and implications for future demand and competition for surface water* presents the results of a study commissioned to collect, collate and analyse existing data to consider implications of groundwater use for the Cap.
Floodplain management

The Floodplain Management Strategy was endorsed by the Ministerial Council in August 2002. The strategy is based firmly on the concept that floodplain management is a State responsibility and that States have in place legal and institutional mechanisms to address floodplain management and flood mitigation issues. Through this strategy, the Ministerial Council can support State efforts by the promotion of floodplain management principles and, along the River Murray, by coordination of floodplain management issues.

Total water resources/groundwater

The project report, Projections of Groundwater Extraction Rates and Implications for Future Demand and Competition for Surface Water was publicly released following agreement by the MDBC Meeting 64 on 25 June 2002. The report examines current groundwater use and allocations across the Basin and projects growth rates in groundwater use under three scenarios: low, medium and high. Groundwater use varies widely across the Basin. The project found that most of the areas where there is a high potential for impacts on stream flows from groundwater pumping lie within groundwater management units that are highly developed and in many cases over-allocated and overused. The report makes a series of recommendations for the future management of the groundwater resources of the Basin to maintain the integrity of the Cap.

In recognition of the need to gain an improved understanding of the changing status of groundwater resources in the Basin, the Groundwater Technical Reference Group established and managed a number of knowledge projects.

- The Groundwater Status Report will produce detailed GIS mapping of groundwater resources. This project follows on from a report on the status of groundwater in 1992 (MDBC 1996). The project will provide an assessment of the status and condition of groundwater resources and indicate to what extent they have changed over time. This will then lead to a definition of which areas of the Basin require a change in the way groundwater is managed and an assessment of current levels of stress that exist in the Basin’s groundwater systems.

- A report of the groundwater flow systems (GFS) modelling completed as part of the Catchment Characterisation Project was published and distributed. It provides a conceptual framework for the classification of GFS into three types—local, intermediate and regional—and further classification into fifteen subsystems. In this way, regions that are characterised by particular GFS can be mapped, creating a tool to support future land management decisions. This work has been incorporated into the mapping for the Groundwater Status Report.
The Watermark – Sustainable Groundwater Use suite of projects are aimed at:

- reviewing current approaches to groundwater management across the Basin;
- developing guiding principles for sustainable groundwater management in irrigated catchments of the Basin;
- developing techniques that allow targets and benchmarks to be set for sustainable use; and
- developing a support process for catchment managers to assist in the implementation of the guiding principles.

Groundwater Models – A community guide to better understanding was published and distributed.

KPA 6 Land and water management—biodiversity/nature conservation

Performance assessments and achievements

Approval of the Native Fish Strategy (NFS)

It is estimated that native fish populations are now at 10% of pre-European levels and likely to decline to 5% unless interventions occur now. Of the 35 native fish species in the Basin, 16 are listed as threatened under State jurisdictions, while 11 exotic species have established self-sustaining populations. The plight of native fish is a major biodiversity issue and investment in their recovery aims to achieve a sustainable level of river ecosystem health.

The NFS for the Basin was approved by the Ministerial Council on 9 May 2003. Its aim is to restore native fish communities in the Basin to 60% of their pre-European levels after 50 years. It provides a framework for community involvement, interstate coordination of management actions and policies, as well as conducting research, monitoring and reporting management activity. The NFS will feed into broader initiatives such as the ICM Policy and the SRA. In its decision on 9 May, the Ministerial Council also:

- noted a Basin-wide investment plan for the strategy, including the need for significant resources (in the order of $72 million) in order to undertake priority actions; and
- noted the MDBC has prepared a funded implementation plan for the NFS in the River Murray system, and agreed to its public release.

Significant progress by the Fish Passage Reference Group

The MDBC has allocated $25 million over five years to build fishways on all MDBC locks and weirs on the River Murray. Along with improvements at existing structures such as at Yarrawonga and Torrumbarry, the building
program will result in effective fish passage from sea to Hume Reservoir. Concurrently, a Basin-wide program for fish passage is being progressed under the umbrella of the NFS. It will include the construction of priority barriers for passage in Queensland, New South Wales and Victoria, and examination of other structures at sites such as Lake Victoria and the Chowilla anabranch.

The Fish Passage Reference Group, comprising engineers and fish ecologists, has been established to provide an advisory, assessment, review and monitoring role. Fishways at Locks 7 and 8 will be completed in the second half of 2003, and the designs for Locks 9 and 10 have already commenced. Prototype fishways at the barrages are expected to be completed by June 2004.

*Improved consideration of cultural heritage in relevant MDBC projects*

In 2002/03 after a broad range of consultations with Indigenous communities and government agencies, the MDBC completed a scoping study on Indigenous involvement in natural resources management. This study provides direction on how to better support the involvement of Indigenous stakeholders in decision making. It also contributes to the development and implementation of mechanisms to ensure the protection and conservation of cultural heritage values of significant sites, places and landscapes. This study, and a process of follow-on regionally based workshops, is being used to develop an Indigenous action plan in response to the Ministerial Council’s resolution to respond to the COAG Reconciliation Commitment. The final range of issues encompassed within the Indigenous action plan will be based on Indigenous views but could include:

- aspects of traditional knowledge and intellectual protection;
- cultural, arts and environmental heritage protocols and processes; and
- capacity building, governance and leadership.

The MDBC and its partner governments have participated in regular meetings with the Murray Darling Rivers Indigenous Nations (MDRIN),

**DRIVING ACTIONS OF THE NFS**

- Rehabilitating fish habitat
- Protecting fish habitat
- Managing riverine structures
- Controlling alien fish species
- Protecting threatened native fish species
- Managing fish translocation and stocking
providing presentations and updates on a range of activities relevant to Indigenous communities. The MDBC and MDRIN are close to finalising a memorandum of understanding that will provide a basis for ongoing engagement and participation of the traditional owners in the MDBC natural resources management processes. Signing of a memorandum of understanding is anticipated in 2003/4.

KPA 7. Supporting on-ground implementation

Sub-output

Investment programs for, and frameworks for directing, on-ground works and measures.

Performance assessments and achievements

Investment programs for, and frameworks for directing, on-ground works and measures.

In May 2002, the Ministerial Council announced a proposal to invest $150 million on operational and structural measures to improve the health of the River Murray. Following this announcement, the Ministerial Council and the MDBC requested a more detailed proposal outlining the likely program and investment for the following three years.

The Living Murray Initiative Proposal for Investment – An Implementation Program of Structural and Operational Works and Measures (2003/04 to 2005/06) documents the program of likely projects with an estimated expenditure of $48 million over the first three years of a seven-year, $150 million implementation program.

During 2002, the implementation program team together with partner government agency representatives from the Australian, New South Wales, Victorian and South Australian governments—the Implementation Program Working Group (IPWG)—developed the Proposal for Investment and identified priority projects through a principled process of selection.

The operational measures and structural works outlined in the Proposal for Investment aim to improve the health of the River Murray system by making the best use of the water currently available and optimising the benefits of any future water recovered, while minimising impacts on consumptive users.

Operational and structural measures proposed for the first three years of the implementation program are focused on improving fish management; floodplain health; flow management from Hume Reservoir to Barmah–Millewa Forest; management of Murray Mouth, Coorong and lower Lakes; and other supporting works.
During 2002/03 initial investments have been made on:
- fishway constructions and investigations;
- wetland works in Victoria and New South Wales;
- investigations in weirpool variations;
- flow modelling in the Goulburn River; and
- scientific investigations in the lower lakes.

KPA 8. Monitoring, evaluation and reporting

**Sub-output**

A framework for monitoring and reporting changes in the condition of the Basin’s natural resources and the outcomes of investment in natural resources planning and management.

**Performance assessments and achievements**

Framework in place to monitor, evaluate and report on:
- the condition of the Basin’s natural resources and pressures associated with their use
- outcomes of investment in natural resources planning and management activities aimed at improving the condition of the Basin’s natural resources
- future natural resources management investment needs

Under the ICM Policy, the MDBC has a commitment to integrate and coordinate:
- monitoring, evaluation and reporting on catchment health targets;
- economic and social impacts of actions to achieve targets;
- the ICM approach; and
- basin investment.

A robust, fully integrated monitoring, evaluation and reporting framework for tracking the health of the Basin’s catchments and the Basin itself has commenced and will take approximately ten years to develop (see Figure 7) for the basic framework.

**Figure 7. Core components of the ICM monitoring framework.**
The ICM approach

The ICM Policy calls for a triennial evaluation of the ICM approach to commence in 2004. A suite of projects to inform that evaluation has been established by the ICM Business Knowledge Committee. They include:

- ICM performance measures;
- a regional ICM baseline study;
- partner approaches to ICM implementation; and
- an evaluation of the MDBC approach.

Basin investment

Reporting on Basin investments is a crucial part of ICM. Annual reporting of investment has not occurred in 2002/03 due to the pressures associated with introducing the NAP and questions over the applicability of data from various sources. A reassessment of the reporting framework and monitoring processes is being undertaken. It is expected that this reporting will be reactivated alongside reporting under the ICM approach study.

Catchment health signals

The ICM Policy specifies that by 2008, the Ministerial Council will have a system for reporting core signals of catchment health for each of the major catchments in the Basin. Catchment health includes:

- water quality (in-stream salinity, nutrients/other aspects affecting algal blooms);

ICM APPROACH: EXAMPLE OF REGIONAL IMPLEMENTATION

The MDBC is developing a baseline study on regional implementation of the ICM approach. This study acknowledges the differing needs and circumstances of each of the Basin’s catchments and will provide an initial view of how different catchment management organisations of the Basin are:

- operating within the institutional systems in place for natural resources management;
- applying their knowledge of the biophysical, social and economic aspects of their regions;
- planning for sustainable management of the natural resources base;
- engaging their stakeholders; and
- implementing their catchment plans.

It will enable catchment groups and governments to compare various approaches and learn from the experiences of others. A pilot in the Mallee Catchment Region has been completed during 2002/03 and will be extended to all 19 catchment regions in the Basin during 2003/04.
water sharing of both surface water and groundwater;
riverine ecosystem health; and
terrestrial biodiversity.

Setting targets relating to each of these areas is a centrepiece of ICM Policy implementation.

During 2002/03, work continued on developing a framework on several fronts to bring together reporting to MDBC and the Ministerial Council on a range of issues for the Basin, including reporting associated with the BSMS (Schedule C), the Cap, the SRA, and The Living Murray and the Water Quality Objectives Project.

**Economic and social impacts**

ICM explicitly widens natural resources management to include social and economic health goals. A monitoring, evaluation and reporting system for economic and social impacts of natural resources management actions has yet to be fully developed. During 2002/03 an evaluation framework is being developed and trialled through The Living Murray project which is established as an exemplar of ICM. The framework when trialled will be assessed in a Basin-wide context.

*Monitoring evaluation and reporting for individual MDBC policies, strategies and programs is carried out within the above framework once it is adopted*

The monitoring, evaluation and reporting framework is being designed and developed to allow direct use of existing jurisdictional reporting arrangements as well as those from existing MDBC project evaluations and reporting.

**Water quality**

Interim in-stream salinity targets have been set for Morgan on the lower River Murray in South Australia and at the end of major valleys throughout the Basin. These targets, combined with salt interception schemes, are designed to maintain predicted 2015 salinity levels at Morgan at their current levels or lower. The timetable for setting water quality targets in the Basin by 2003 other than salinity will not be achieved and an alternative approach is being explored.

**Water sharing**

The monitoring associated with agreed and planned water sharing arrangements are covered in detail elsewhere in the report (see section on water entitlement and efficiency of use, p. 71).

**Riverine ecosystem health**

The SRA is a reporting and assessment tool that is being developed by the MDBC and its partner governments to assess the health of the Basin’s
rivers. It aims to provide consistent, Basin-wide information on the health of rivers to promote sustainable land and water management. To achieve this, the program will develop indicators and methods for river health assessment that are robust and consistent across catchments and over time.

During 2002/03, a pilot SRA was implemented in four valleys:

- the Ovens valley in Victoria;
- the Condamine–Culgoa catchment straddling the Queensland/New South Wales border;
- the Lachlan in New South Wales; and
- part of the River Murray within South Australia.

Results from the pilot audit will be reported to the MDBC in October 2003, with recommendations for a full audit across the Basin. These recommendations will be considered by the Ministerial Council in November 2003.

The pilot audit results are already providing the MDBC with an insight into river health and condition of the four pilot valleys and as well as excellent information to underpin other MDBC initiatives such as the NFS and The Living Murray. Sampling for the pilot led to some surprise discoveries for the Basin including:

- locating nighthawk dragonfly larvae in the Lachlan valley and subsequent first capture of a wild adult nighthawk;
- capture in two subcatchments near Chinchilla of Rendahl’s catfish—a fish that had previously not been caught in the Basin; and
- discovery of a previously unknown tiny aquatic earthworm in sweep net samples in the lower River Murray from Lindsay River to Tailem Bend.

Discovery of these species within the random sampling design of the pilot SRA emphasises how much there is to learn about river health in the Basin. The results of the pilot audit are currently being analysed and will be reported in 2003/04.
During 2002/03, the Independent SRA Group made up of four eminent ecologists with extensive expertise in river ecology and river health monitoring has also been established to assist with the design of the future audit function. This will include the examination of river health reports from the participating governments and reporting to the Ministerial Council, in a similar way to the reporting undertaken by the Independent Audit Group. The monitoring and reporting framework for those river health reports is being developed as part of the pilot audit project and will be further refined as the audit progresses.

**MDBC policies and priorities for on-ground action take account of reports on Basin health, investment outcomes and future investment needs**

The monitoring, evaluation and reporting framework is being designed as part of an overall adaptive approach to ICM. Under this approach the knowledge gained and lessons learnt from actions will be used to improve those actions and initiate new actions and policies. It is not yet possible to report on this approach. The 2004 *ICM Evaluation Report* will contain recommendations for continual improvement of performance to be assessed and reported in future annual reports.
5

PARTNER RELATIONS

Collection of images from the Rivers Festival held at Berri, South Australia. Sculpture of water bird in collage by Indiana James.

Photos: Italo Vardaro

Output

Effective inter-governmental and government–community partnerships that lead to strong commitment to the Initiative and well-informed Ministerial Council decisions.
5.1 Program support and administrative structures

Overview

During 2002/03 the MDBC and Ministerial Council were advised by a number of policy and knowledge committees, technical working groups, representatives from the CAC, project boards and panels made up of representatives of the community.

These advisory groups draw on a wide range of expertise and experience and include commissioners, deputy commissioners, executive and staff from the MDBC, CAC members, and community representatives from within and beyond the Basin. Membership of the main advisory groups are shown in Appendices B–D.

During 2002/03, The Living Murray initiative was a major new commitment by the Ministerial Council. It was supported and advised by:

- a specific project board;
- an independent community engagement panel reviewing the engagement process;
- a community reference panel; and
- a range of issue-specific scientific panels.

Water Business

The River Murray Advisory Board advises the MDBC on the operation of RMW, which is an internal business unit of the MDBC. This board includes representatives from the four governments that have a direct interest in the management of the River Murray system. It has an independent business expert and is chaired by the MDBC’s President.

During 2002/03, the board provided a strategic direction on:

- water resource assessment and management with particular emphasis on managing through a critical drought;
- improvement to structures along the River Murray to enhance operational safety and concurrently to provide fish passage through The Living Murray initiative; and
- development of service agreements with constructing authorities and operational protocols for all works.
Natural Resources Business

The 2002/03 financial year was a period of consolidation of the three new knowledge committees developed to support Natural Resources Business.

The ICM Policy Committee that was established in 2001 refined an investment plan for knowledge generation in the Basin. This three-year plan has prioritised areas of investment and was approved by the MDBC as a basis for the allocation of operational budgets. Following setting of the broad strategic direction by the ICM Policy Committee, the three knowledge committees gave specific advice on the development of projects to be funded within that area resulting in a more targeted approach for investment in natural resources management and strengthening the connection between the two main internal funding programs. These are:

- strategic investigation (funded through the internal SI&E Program); and
- policy development (funded through the internal Special Policy Development [SPD] Program).

During 2002/03 seven project boards were operational and addressed a number of specific natural resources issues (see Appendix D). These boards report directly to the MDDBC and have been established to address an agreed, high priority, Basin-wide issue.

Consolidation on how to maximise and ensure efficient links between the knowledge committees and relevant project boards continued. This has resulted in the development of new internal reporting arrangements in the MDDBC Office and streamlined budget allocation and operating procedures.

Business administration

All areas of investment made by the MDDBC are vetted by the Finance Committee. During 2002/03, this committee continued to provide advice on budgetary and other financial issues, corporate planning and corporate governance.

Information technology services were implemented during 2002/03 including the renewal of a range of operating systems and improvement of external and internal servers supporting the MDDBC website and data collection and storage.

A new internal document control system was successfully completed. Roll out for the MDDBC Office commenced in 2002/03. It ensures correct archiving of all internal files including incoming and external correspondence. It is essential for improved efficiency within an expanding office structure and greater reliance on electronic documentation and correspondence.
5.2 Performance reports

KPA 9. Services to partners

Sub-output

Services that ensure effective participation of the CAC and partner governments in the development of MDBC policies and programs, and effective participation of stakeholders in relevant MDBC activities

Performance assessments and achievements

Services in place for effective CAC participation in MDBC activities as an equal partner

The CAC met on three occasions in 2002/03 as well as attending a joint meeting with the Ministerial Council in Adelaide on 1 November 2002 and a joint workshop with the MDBC on 2 June 2003 in Coolangatta. The CAC Chairman attended all the Ministerial Council and MDBC meetings during the year and CAC members participated in many of the meetings and workshops associated with MDBC activities.

Services to support this participation are provided both from the CAC Secretariat and the wider MDBC staff. This includes preparing and distributing agenda papers, organising and helping to run meetings and coordinating follow-up actions.

Due to the volume, technical nature of the material and short time lines involved in preparing for meetings, CAC members sometimes feel that they are not able to maximise the effectiveness of the input they provide. There is generally an absence of ongoing information and dialogue between meetings.

In 2003/04 the CAC Secretariat will be trialling new initiatives to assist CAC members to be more effective in their contributions to MDBC working groups and committees such as pre- and post-meeting briefings, more streamlined information provision and ongoing dialogue on issues between meetings.

As the key community input to the MDBC’s policy development, CAC members are also cognisant of the need to develop a greater capacity to interact with and gather information on the views of the wider community.

Services in place for effective participation of partner governments in MDBC activities

The key forum for effective partner government participation in the Initiative is through the MDBC. Four MDBC meetings are held each year, with additional meetings called to address specific issues and out-of-
session resolutions of more urgent business. In 2002/03, eight meetings of the MDBC were held, including:

- four formal meetings;
- one workshop focused on The Living Murray; and
- three teleconferences to discuss water availability during the peak of the drought.

Other mechanisms for effective participation by partner governments are through their representation on committees, project boards and other groups advising the MDBC. Most committees, working groups and taskforces are jurisdictionally based and include participants from each partner government. Project boards are generally made up of three to four members. They are commissioners, deputy commissioners, CAC members or senior agency staff.

In 2002/03, the MDBC supported some 30 committees, working and other groups to which partner government staff were significant contributors.

The MDBC Office provides support services to ensure the effective operation of the MDBC and these committees and groups. This includes preparing and distributing agenda papers, organising and helping to run meetings, coordinating follow-up actions and responding to other relevant requests.

The Murray-Darling Basin contact officers based in each participating government provide the key link to effective participation of and communication with staff from relevant government agencies.

*Processes in place for effective participation of stakeholders in key MDBC projects*

The CAC and staff from partner governments provide most of the stakeholder input to MDBC activities through participation on committees, project boards and other groups. Additional opportunities may be involved through projects.

During 2002/03 special processes continued to allow wider stakeholder participation in the MDBC’s Water Business and Natural Resources Business, in particular The Living Murray initiative and the development of the Murray-Darling Basin Indigenous Action Plan. Many projects within the MDBC’s SI&E funding program involve extensive consultation with key stakeholders in industry, research organisations, government agencies and Indigenous communities.

The inclusion of a wider group of stakeholders in MDBC activities is largely ad hoc and dependent on contact networks of the MDBC staff. The development of a MDBC Engagement Policy during 2003/04 has been identified as part of the implementation of the ICM Policy (2001). This
policy will assist in the development of a comprehensive and consistent approach to engaging a wide range of stakeholders in MDBC activities.

**KPA 10 – Services to the Ministerial Council**

**Sub-output**

*Services that support effective Ministerial Council decision making*

**Performance assessment and achievement**

*Support services provided as agreed*

The Ministerial Council usually meets twice each year. When decisions are required outside the meeting schedule, out-of-session resolutions are coordinated through the MDBC Office. In 2002/03 the Ministerial Council met twice and three out-of-session decisions were taken.

---

**THE LIVING MURRAY—STAKEHOLDER PARTICIPATION**

- The community reference panel consists of community representatives with a recognised interest or expertise in the management of the River Murray system. It is a forum to provide a range of community views and advice to the Living Murray Project Board.

- The scientific reference panel provides independent expert scientific advice to the Living Murray Project Board on the development of environmental flow management options around the three reference points.

- During 2002/03, The Living Murray initiative held more than 55 community meetings and briefings to inform stakeholders of the initiative and ways to be involved.

- The issues log is a summary of all issues raised by stakeholders and copies of submissions. It was established on The Living Murray initiative web page within the MDBC website. Stakeholders are able to view issues and responses, and contribute additional information.

- The independent community engagement panel consists of four independent and experienced community representatives who report to the Ministerial Council on the integrity of the Living Murray Community Engagement Strategy and decision-making processes. It provides a consistent and impartial public contact for The Living Murray initiative and gives confidence to the community that their contributions are respected.

- The Indigenous engagement process has been undertaken in partnership with the MDRIN to provide for inclusion of Indigenous views, values and concerns for the River Murray.
The MDBC Office provides support services to ensure the effective operation of meetings and out-of-session decisions by the Ministerial Council. This includes preparing and distributing agenda papers, organising and helping to run meetings, and the administration of out-of-session decision making.

The MDBC Office continues to experience difficulties in providing agenda papers and other information within the timelines specified by the Ministerial Council due to the evolving and reactive nature of key initiatives under consideration. Improved project management systems and a review of the Secretariat function during 2002/03 have assisted in identifying and addressing a range of issues but further adjustments will continue to be implemented through 2003/04.

The office of independent President plays a key role in supporting both the Ministerial Council and the MDBC. The MDBC Office provides support to the President to fulfil this role.
Commission officers provide comprehensive support for knowledge projects – the scientific backbone for the effective management of the Basin’s natural resources

Output

An MDBC Office where staff are valued and motivated through job satisfaction and sharing the ideals of the MDBC, with the best practice administrative and knowledge management systems that provide transparency and accountability and support staff in their work

Photo: Michael Jensen
6.1 2002/03 Budget

The Ministerial Council approved a Budget of $79.9 million for 2002/03 (see Table 14).

Table 14. Composition of 2002/03 Budget approved by the Ministerial Council.

<table>
<thead>
<tr>
<th></th>
<th>$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Murray Water</td>
<td>47.4</td>
</tr>
<tr>
<td>Natural Resources Business</td>
<td>26.3</td>
</tr>
<tr>
<td>Partner Relations</td>
<td>0.6</td>
</tr>
<tr>
<td>Business Administration</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>79.9</strong></td>
</tr>
</tbody>
</table>

Table 15. Contributions of contracting governments and other funding sources.

<table>
<thead>
<tr>
<th></th>
<th>$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Government</td>
<td>13.9</td>
</tr>
<tr>
<td>New South Wales</td>
<td>22.6</td>
</tr>
<tr>
<td>Victoria</td>
<td>21.0</td>
</tr>
<tr>
<td>South Australia</td>
<td>16.4</td>
</tr>
<tr>
<td>Queensland</td>
<td>0.9</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total contracting governments</strong></td>
<td><strong>75.1</strong></td>
</tr>
<tr>
<td>Other income (other services)</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Total MDBC funding</strong></td>
<td><strong>79.9</strong></td>
</tr>
</tbody>
</table>

6.2 Financial statements

The Australian National Audit Office (ANAO) continues as the MDBC’s auditor.

The financial statements have been prepared on an accruals basis. These statements, including the auditor’s report and the statement on behalf of the MDBC are provided on pages 117–142.
6.3 2003/04 Budget

In May 2003, the Ministerial Council approved a budget of $96.1 million for 2003/04 (see Table 16).

Table 16. Composition of 2003/04 Budget approved by the Ministerial Council.

<table>
<thead>
<tr>
<th></th>
<th>$ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Murray Water</td>
<td>54.8</td>
</tr>
<tr>
<td>Natural Resources Business</td>
<td>34.4</td>
</tr>
<tr>
<td>Partner Relations</td>
<td>0.9</td>
</tr>
<tr>
<td>Business Administration</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>96.1</strong></td>
</tr>
</tbody>
</table>

6.4 Staff

The MDBC Office is staffed with highly professional and competent people, who provide policy advice, investigation services and program coordination.

Employment conditions are covered by the MDBC Certified Agreement with staff engaged in continuing, fixed-term, secondment, part-time and casual categories. Secondments are mainly from partner agencies.

With the increasing number of projects in the Basin, additional staff have been employed taking the total to 100 as at 30 June 2003.

Table 17. Staff structure.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Executive</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>All other classifications</td>
<td>39</td>
<td>51</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>46</td>
<td>53</td>
<td>99</td>
</tr>
</tbody>
</table>

The skills base of the MDBC Office (Table 18) reflects the strategic role of the MDBC in the formulation, coordination and implementation of policies and in the application of sound management and business procedures.
Workplace Agreement

Negotiations for a new workplace agreement commenced in February 2003 and were well progressed by 30 June 2003. Negotiations proceeded on the basis of shared knowledge and information and in a cooperative spirit with no disruptions to MDBC activities other than employees attending approved staff meetings.

If approved, the agreement will be for a period of three years.

Professional development

The Executive Development Program was introduced in June 2002. One group completed the program in November 2002. A further program is being planned for later in 2003.

The Professional Development Program series was organised and made available to all staff with various in-house seminars and workshops covering a wide range of topics.

Professional management and development

Additional measures have been introduced to facilitate the full implementations of the Performance Management and Development Scheme. A particular feature is the introduction of specific dates for performance reviews for all employees.

Table 18. Academic qualifications.

<table>
<thead>
<tr>
<th>Summary qualifications</th>
<th>Total</th>
<th>Science</th>
<th>Engineering</th>
<th>Business/Arts/Commerce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctorate</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Masters</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor</td>
<td>54</td>
<td>27</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Other tertiary</td>
<td>18</td>
<td>–</td>
<td>–</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>33</td>
<td>16</td>
<td>35</td>
</tr>
</tbody>
</table>

6.5 Performance reports

KPA 11. People management

Performance assessments and achievements

Workplace Agreement

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Professional management and development

Additional measures have been introduced to facilitate the full implementations of the Performance Management and Development Scheme. A particular feature is the introduction of specific dates for performance reviews for all employees.
KPA 12. Business systems and financial administration

Sub-output

Systems and procedures that are effective and efficient.

Performance assessments and achievements

Knowledge management, administrative and financial management systems which safeguard the interests of the MDBC and provide accurate, relevant and timely information to support decision making

A new document and records management system was implemented during 2002/03. This system has already delivered improved access and control on electronic and paper documents and records within the MDBC Office. The convergence, in one application, of the electronic document, mail and records management environments has provided a system into which electronic documents generated in a number of applications as well as paper records can be created, modified, registered, shared, referenced, retrieved and archived. Complementary policies and processes have assisted in increasing the efficiency of all staff in the use and reuse of corporate information.

Enhanced functionality of the Financial Management Information System through the implementation of two upgrades including a fully integrated asset management system was delivered during 2002/03. Planning for the implementation of a budget support module has been undertaken and will be implemented in the 2003/04 financial year. This will provide the capacity for end users to develop budgets more efficiently within the Financial Management Information System. Multi-dimensional enquiry, reporting, budgeting and analysis will be delivered at the desktop.

Information technology (IT) infrastructure in place to support business and operating systems

The upgrade of the MDBC’s IT infrastructure was completed in 2002/03 resulting in the establishment of Windows 2000 servers supporting active directory, file and print services, and email. These complement the MDBC’s Unix servers, supporting back-end databases, and web and security services.

It is envisaged that this infrastructure architecture can now grow to support the evolving business needs of the MDBC with appropriate information and financial management applications, including the deployment of the upgraded Corporate Financial Management Information System to appropriate staff, and the planned upgrade to the Document and Records Management System to the current release of the application. A contacts management system is under development and is expected to be operational in the second quarter of 2002/03. The MDBC’s intranet
continues to grow and has become a valuable repository of corporate information.

A significant target for 2003/04 will be to develop tools and templates to support the Project Management Improvement Initiative which commenced in 2002/03. Strategies are being developed to provide improved and consistent project monitoring and reporting information.
FINANCIAL STATEMENTS
INDEPENDENT AUDIT REPORT

To the Chairman of the Murray-Darling Basin Ministerial Council

Scope

I have audited the financial statements of the Murray-Darling Basin Commission for the year ended 30 June 2003. The financial statements comprise:

- Statement on behalf of the Commission by the President and the Chief Executive Officer;
- Statements of Financial Performance, Financial Position and Cash Flows;
- Schedules of Commitments and Contingencies; and
- Notes to and forming part of the Financial Statements.

The President and the Chief Executive Officer of the Commission are responsible for the preparation and presentation of the financial statements and the information they contain. I have conducted an independent audit of the financial statements in order to express an opinion on them to you.

The audit has been conducted in accordance with the Australian National Audit Office Auditing Standards, which incorporate the Australian Auditing Standards, to provide reasonable assurance as to whether the financial statements are free of material misstatement. Audit procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with Accounting Standards and other mandatory professional reporting requirements in Australia and statutory requirements so as to present a view which is consistent with my understanding of the Commission’s financial position, its financial performance and its cash flows.

The audit opinion expressed in this report has been formed on the above basis.
Audit Opinion

In accordance with sub-clause 84(4) of the Murray-Darling Basin Agreement 1992, I now report that the financial statements are in agreement with the accounts and records of the Murray-Darling Basin Commission and in my opinion:

(i) the financial statements are based on proper accounts and records;

(ii) the financial statements are in agreement with those accounts and records;

(iii) the receipt, expenditure and investment of moneys, and the acquisition and disposal of assets by the Commission during the year have been in accordance with the Murray-Darling Basin Agreement 1992; and

(iv) the financial statements give a true and fair view, in accordance with applicable Accounting Standards and other mandatory professional reporting requirements in Australia of the financial position of the Murray-Darling Basin Commission as at 30 June 2003, and its financial performance and cash flows for the year then ended.

Australian National Audit Office

[Signature]

Mashelle Parrett
Executive Director

Delegate of the Auditor-General

Canberra
9 September 2003
Statement on Behalf of the Commission

In our opinion, the attached financial statements give a true and fair view of the financial position and transactions of the Murray-Darling Basin Commission for the year ended 30 June 2003

R M Green AO
President

D J Blackmore
Chief Executive
STATEMENT OF FINANCIAL PERFORMANCE
for the year ended 30 June 2003

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$'000</td>
<td>$'000</td>
</tr>
<tr>
<td>Revenue from ordinary activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue from governments 2A</td>
<td>75 116</td>
<td>63 061</td>
</tr>
<tr>
<td>Sale of goods and services 2B</td>
<td>2 726</td>
<td>1 062</td>
</tr>
<tr>
<td>Interest 2C</td>
<td>1 425</td>
<td>1 864</td>
</tr>
<tr>
<td>Revenue from sale of assets 3E</td>
<td>67</td>
<td>95</td>
</tr>
<tr>
<td>Revenue on recognition of infrastructure assets 1.6, 2D</td>
<td>42 546</td>
<td>1 582 012</td>
</tr>
<tr>
<td>Total revenue from ordinary activities</td>
<td>121 880</td>
<td>1 648 094</td>
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<tr>
<td>Expenses from ordinary activities</td>
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<tr>
<td>Employees 3A</td>
<td>7 526</td>
<td>5 755</td>
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<td>Suppliers 3B</td>
<td>45 658</td>
<td>63 021</td>
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<tr>
<td>Depreciation and amortisation 3C</td>
<td>25 847</td>
<td>7 809</td>
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<tr>
<td>Value of assets sold 3E</td>
<td>68</td>
<td>107</td>
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<tr>
<td>Total expenses from ordinary activities</td>
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<td>76 692</td>
</tr>
<tr>
<td>Interest on finance lease 3D</td>
<td>26</td>
<td>31</td>
</tr>
<tr>
<td>Net surplus (deficit)</td>
<td>42 755</td>
<td>1 571 371</td>
</tr>
<tr>
<td>Total changes in equity other than those resulting from transactions with owners as owners</td>
<td>42 755</td>
<td>1 571 371</td>
</tr>
</tbody>
</table>

The above statement should be read in conjunction with the accompanying notes.
# STATEMENT OF FINANCIAL POSITION

as at 30 June 2003

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$'000</td>
<td>$'000</td>
</tr>
</tbody>
</table>

## ASSETS

### Financial assets

<table>
<thead>
<tr>
<th>Item</th>
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<th>2003</th>
<th>2002</th>
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<tbody>
<tr>
<td>Cash</td>
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<td>21 305</td>
<td>7 093</td>
</tr>
<tr>
<td>Receivables</td>
<td>4B</td>
<td>3 248</td>
<td>2 792</td>
</tr>
<tr>
<td>Investments</td>
<td>4C</td>
<td>18 000</td>
<td>32 000</td>
</tr>
<tr>
<td>Other</td>
<td>4D</td>
<td>888</td>
<td>888</td>
</tr>
</tbody>
</table>

**Total financial assets**

| 43 441 | 42 773 |

### Non-financial assets

<table>
<thead>
<tr>
<th>Item</th>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure Assets</td>
<td>1.6, 5A</td>
<td>1 618 699</td>
<td>1 574 509</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>5A</td>
<td>1 029</td>
<td>860</td>
</tr>
<tr>
<td>Inventories</td>
<td>5B</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Fitout</td>
<td>5C</td>
<td>222</td>
<td>283</td>
</tr>
<tr>
<td>Other</td>
<td>5D</td>
<td>104</td>
<td>1 161</td>
</tr>
</tbody>
</table>

**Total non-financial assets**

| 1 620 071 | 1 576 814 |

**Total assets**

| 1 663 512 | 1 619 587 |

## LIABILITIES

### Interest bearing liabilities

<table>
<thead>
<tr>
<th>Item</th>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leases</td>
<td>6A</td>
<td>269</td>
<td>328</td>
</tr>
</tbody>
</table>

**Total interest bearing liabilities**

| 269   | 328   |

### Provisions and payables

<table>
<thead>
<tr>
<th>Item</th>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>7A</td>
<td>1 663</td>
<td>1 240</td>
</tr>
<tr>
<td>Suppliers</td>
<td>7B</td>
<td>20 488</td>
<td>19 603</td>
</tr>
</tbody>
</table>

**Total provisions and payables**

| 22 151 | 20 843 |

### Total revenue in advance

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>7C</td>
<td>13 955</td>
<td>14 617</td>
</tr>
</tbody>
</table>

**Total liabilities**

| 36 375 | 35 788 |

**Net Assets**

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 627 137</td>
<td>1 583 799</td>
</tr>
</tbody>
</table>

## EQUITY

<table>
<thead>
<tr>
<th>Item</th>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulated surpluses</td>
<td>8</td>
<td>1 624 523</td>
<td>1 581 768</td>
</tr>
<tr>
<td>Contributions by Contracting Governments</td>
<td>8</td>
<td>2 614</td>
<td>2 031</td>
</tr>
</tbody>
</table>

**Total equity**

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 627 137</td>
<td>1 583 799</td>
</tr>
</tbody>
</table>

### Current liabilities

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35 378</td>
<td>34 931</td>
</tr>
</tbody>
</table>

### Non-current liabilities

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>997</td>
<td>857</td>
</tr>
</tbody>
</table>

### Current assets

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>43 562</td>
<td>43 935</td>
</tr>
</tbody>
</table>

### Non-current assets

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 619 950</td>
<td>1 575 652</td>
</tr>
</tbody>
</table>

The above statement should be read in conjunction with the accompanying notes.

122
STATEMENT OF CASH FLOWS
for the year ended 30 June 2003

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>$'000</td>
<td>$'000</td>
<td></td>
</tr>
</tbody>
</table>

OPERATING ACTIVITIES
Cash received
- Contributions by Governments 74 448 62 151
- Sale of goods and services 2 796 1 601
- Interest 1 513 1 815
- GST received from ATO 7 207 4 687
Total cash received 85 964 70 254

Cash used
- Employees (7 103) (5 556)
- Suppliers (51 546) (60 257)
- Interest on finance lease (26) (31)
Total cash used (58 675) (65 844)
Net cash from operating activities 19 27 289 4 410

INVESTING ACTIVITIES
Cash received
- Proceeds from sale of property, plant and equipment 67 95
- Investments 14 000 –
Total cash received 14 067 95

Cash used
- Purchase of Infrastructure Assets (27 085) –
- Purchase of property, plant and equipment (583) (560)
- Investments – (17 000)
Total cash used (27 668) (17 560)
Net cash from/(used by) investing activities (13 601) (17 465)

FINANCING ACTIVITIES
Cash received
- Contributions by Contracting Governments for purchase of assets 583 560
Total cash received 583 560

Cash used
- Repayments of lease debt (59) (55)
Total cash used (59) (55)
Net cash from/(used by) financing activities 524 505

Net increase/(decrease) in cash held 14 212 (12 550)
Cash at beginning of reporting period 7 093 19 643
Cash at end of reporting period 21 305 7 093

The above statement should be read in conjunction with the accompanying notes.

Financial statements
SCHEDULE OF COMMITMENTS
as at 30 June 2003

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$’000</td>
<td>$’000</td>
</tr>
</tbody>
</table>

BY TYPE

CAPITAL COMMITMENTS
Total capital commitments  28  –

OTHER COMMITMENTS
Operating leases  2 157  2 748
Other Commitments  10 320  19 595

12 477  22 343

Commitments receivable  (1 137)  –
Total commitments payable  11 368  22 343

BY MATURITY

All net commitments
One year or less  8 568  10 503
From one to five years  2 800  11 840

Net commitments  11 368  22 343

Operating lease commitments
One year or less  572  591
From one to five years  1 585  2 157

Total operating lease commitments  2 157  2 748

Commitments are GST inclusive where relevant.

The Commission has entered into an agreement to lease office accommodation at 15 Moore Street, Canberra City, that expires on 28 February 2007. Lease payments are subject to an annual increase of 4%. The initial term of the lease is still current and may be renewed for a further five years at the Commission’s option.

As at 30 June 2003, other commitments comprise amounts payable under contracts in respect of which the recipient is yet to provide the services required to meet the contractual conditions.

The above schedule should be read in conjunction with the accompanying notes.
SCHEDULE OF CONTINGENCIES
as at 30 June 2003

<table>
<thead>
<tr>
<th>Notes</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTINGENT LIABILITIES</td>
<td>353</td>
<td>353</td>
</tr>
<tr>
<td>CONTINGENT RECEIVABLES</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Net contingencies</td>
<td>353</td>
<td>353</td>
</tr>
</tbody>
</table>

A major contractor has withdrawn from a salinity mitigation project. Claims for expenses in the order of $353,000 have been served on the Commission. The Commission has legal advice asserting there is no contractual or other basis to support the claim.

SCHEDULE OF UNQUANTIFIABLE CONTINGENCIES

In October 2002, a landowner commenced proceedings against the Commission and former Commissioners in the Supreme Court of New South Wales in relation to a release of water from Hume Reservoir in 1996. The Commission is defending the action.

As at 30 June 2003, the Commission was joined as a party to a matter before the courts related to land rights. It is not possible to estimate the amounts of any payments that may eventually be required in relation to this case.

The above schedule should be read in conjunction with the accompanying notes.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

1 Summary of significant accounting policies

1.1 Basis of accounting

The financial statements are a general purpose financial report on the financial position and transactions of the Commission. As indicated in Note 1.6, these statements incorporate infrastructure assets considered to be held in trust by State Constructing Authorities on behalf of the Commission.

The financial statements have been prepared in accordance with
- Australian Accounting Standards and Accounting Interpretations issued by the Australian Accounting Standards Board,
- Consensus Views of the Urgent Issues Group and having regard to Statements of Accounting Concepts.

The Statement of Financial Performance and Statement of Financial Position have been prepared on an accrual basis in accordance with historical cost conventions, except for infrastructure assets, which as noted, are at valuation. No allowance is made for the effect of changing prices on the results or financial position.

1.2 Changes in accounting policy

The accounting policies used in the preparation of these financial statements are consistent with those used in 2001-2002, except in respect of measurement of certain employee benefits at nominal amounts.

The Commission will revalue infrastructure assets on a fair value basis with effect from 1 July 2003.

1.3 Taxation

Throughout the year under review, the Commission was exempt from all forms of taxation except fringe benefits tax and goods and services tax. Where applicable, appropriate provisions for goods and services tax have been included.

1.4 Inventories held for sale

Inventories comprise publications and videos held for sale or free distribution as part of the Commission’s communications program. Inventories are stated at the lower of cost and net realisable value.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

1.5 Property plant and equipment held by the Commission

All property plant and equipment with a cost equal to or in excess of $600 is capitalised in the year of acquisition and is reported at cost value. All depreciable non-current assets are written off to their estimated realisable value over their estimated useful lives using the straight line method of depreciation. Approximately 65% of the value of these items (excluding infrastructure assets) is in computer equipment and motor vehicles which are generally disposed of within three years.

The following useful lives and depreciation rates have been assumed for each category of asset.

<table>
<thead>
<tr>
<th>Asset Category</th>
<th>Useful Life</th>
<th>Depreciation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Vehicles</td>
<td>6.67 years</td>
<td>(15% p.a.)</td>
</tr>
<tr>
<td>Computers and IT equipment</td>
<td>3.00 years</td>
<td>(33.3% p.a.)</td>
</tr>
<tr>
<td>Office Equipment</td>
<td>5.88 years</td>
<td>(17% p.a.)</td>
</tr>
<tr>
<td>Furniture, Fixtures and Fittings</td>
<td>7.69 years</td>
<td>(13% p.a.)</td>
</tr>
<tr>
<td>Infrastructure assets</td>
<td>Up to 400 years - based on assessment of future economic life.</td>
<td>Up to 400 years - based on assessment of future economic life.</td>
</tr>
</tbody>
</table>

Leasehold improvements are amortised over the estimated life of the improvements or the unexpired portion of the lease whichever is the lesser.

Under the provisions of the Murray-Darling Basin Agreement, Contracting Governments are required to contribute to the operating and capital expenditure of the Commission on an annual basis. Contributions by Contracting Governments for the purchase of assets are treated as a contribution of equity.

Recoverable amount test

The carrying amount of each item of property plant and equipment has been reviewed to determine whether it is in excess of the asset’s recoverable amount. No write down to recoverable amounts has been made in 2002-2003.

1.6 Infrastructure Assets

Infrastructure assets used for the storage and distribution of bulk water and for related activities have been constructed with funds provided by the Commission. These assets are located in the states and operated by employees of state government agencies.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

Infrastructure Assets have been recognised following a decision of the Murray-Darling Basin Commission on 12 March 2002. The Commission determined that requirements for control as specified in the Accounting Standards had been met and that it was now appropriate to recognise these assets.

Revenue from ordinary activities for 2002-2003 included an amount of $42,546,000, adjusting the value of Infrastructure Assets as at 1 July 2002 to include additions since 30 June 2000.

The financial effect of this treatment is to include revenue of $42.546 million with a corresponding increase in Infrastructure Assets in the Statement of Financial Position.

Depreciation of $25.442 million has been recognised for the period from 1 July 2002 to 30 June 2003.

The Murray-Darling Basin Agreement requires each Contracting Government to account to the Commission for all monies received from the Commission under the Agreement. The Commission must cause a list to be kept of both the assets it acquires and the assets Constructing Authorities acquire with funds made available by the Commission. To meet these requirements, assets acquired by the Commission are included in the Commission’s asset registers and accounts (see Note 1.5) and each of the State Constructing Authorities is required by the Commission to prepare an asset register which is to be made available to the Commission on request. The Commission has developed registers of all assets acquired with funds provided by the Commission.

1.7 Employee Benefits

All vesting employee entitlements (including salaries, employer superannuation contributions, recreation leave, and long service leave) are recognised as liabilities. Liabilities for recreation leave, employer superannuation contributions, and salaries are measured at current remuneration rates at 30 June 2003 (nominal value). The nominal amount is calculated with regard to the rates expected to be paid on settlement of the liability. This is a change in accounting policy from last year required by initial application of a new Accounting Standard AASB1028 from 1 July 2002.

The provision for long service leave at 30 June 2003 is measured at the present value of estimated cash outflows attaching to the nominal value at 30 June 2003. Estimated cash outflows are calculated by adjusting the nominal value for each employee for potential remuneration increases and
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

applying a probability factor related to years of service to estimate expected payout and year of payment.

The classification of recreation and long service leave liabilities into current and non-current is based on the past history of payments. No provision has been made for sick or personal circumstances and support leave as all such leave is non-vesting and the average leave taken by employees for these purposes is less than the annual entitlement for these forms of leave.

1.8 Leases

A distinction is made between finance leases which effectively transfer from the lessor to the lessee substantially all the risks and benefits incidental to the ownership of leased assets and operating leases under which the lessor effectively retains all such risks and benefits. Operating lease payments are expended on a basis which is representative of the pattern of benefits derived from the leased assets.

Where a non-current asset is acquired by means of a finance lease, the asset is capitalised at the present value of minimum lease payments at the inception of the lease and a liability recognised for the same amount. Leased assets are amortised over the period of the lease. Lease payments are allocated between the principal component and the interest expense.

1.9 Lease Incentives

Lease incentives are recognised as liabilities on receipt of the incentive. The amount of liability is reduced by allocating lease payments between rental expense and reduction of liability.

The lease incentive is based on the first 3 months of occupying the premises being free.

1.10 Revenue

The revenues described in this note are revenues relating to the core operating activities of the Commission.

Revenue from Governments is recognised by reference to the extent to which activities to be funded by that revenue have been completed.

Interest revenue is recognised on a proportional basis taking into account the interest rates applicable to the financial assets.

Revenue from disposal of non-current assets is recognised when control of the asset has passed to the buyer.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

Amounts received in advance to fund projects in future years and unspent funds provided for the current year that have been authorised to be carried-over to the following year in accordance with clause 75 of the Murray-Darling Basin Agreement are treated as revenue received in advance.

1.11 Cash

For the purpose of the statement of cash flows, cash includes cash on hand and on call at the bank.

1.12 Rounding

Amounts, including totals and sub-totals are rounded to the nearest $1,000 except in relation to:
- remuneration of officers
- remuneration of commissioners, and
- remuneration of auditors

1.13 Resources received free of charge

The Commission receives no resources free of charge.

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$'000</td>
<td>$'000</td>
</tr>
</tbody>
</table>

2 Revenues from ordinary activities

2A Revenue from governments

Contributions by contracting governments:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth</td>
<td>13 947</td>
<td>11 395</td>
</tr>
<tr>
<td>New South Wales</td>
<td>22 562</td>
<td>19 176</td>
</tr>
<tr>
<td>Victoria</td>
<td>21 016</td>
<td>17 741</td>
</tr>
<tr>
<td>South Australia</td>
<td>16 376</td>
<td>13 436</td>
</tr>
<tr>
<td>Queensland</td>
<td>869</td>
<td>682</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>261</td>
<td>281</td>
</tr>
<tr>
<td>Add revenue in advance in 2001-2002</td>
<td>13 650</td>
<td>14 668</td>
</tr>
<tr>
<td>Add Contributions paid in 2001-2002</td>
<td>250</td>
<td>142</td>
</tr>
<tr>
<td>Less contributions paid for 2003-2004 in advance</td>
<td>(250)</td>
<td>(250)</td>
</tr>
<tr>
<td>Less revenue carried forward to 2003-2004</td>
<td>(12 982)</td>
<td>(13 650)</td>
</tr>
<tr>
<td>Less equity contribution for purchase of assets</td>
<td>(583)</td>
<td>(560)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>75 116</strong></td>
<td><strong>63 061</strong></td>
</tr>
</tbody>
</table>
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>'000</td>
<td>'000</td>
</tr>
<tr>
<td>2B Sale of goods and services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydro generation and land and cottage rents</td>
<td>2 699</td>
<td>1 041</td>
</tr>
<tr>
<td>Sale of publications and videos</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>2 726</td>
<td>1 062</td>
</tr>
<tr>
<td>2C Interest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest from bank and investments</td>
<td>1 425</td>
<td>1 864</td>
</tr>
<tr>
<td></td>
<td>1 425</td>
<td>1 864</td>
</tr>
<tr>
<td>2D Revenue on recognition of infrastructure assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognition of infrastructure assets at 30 June 2003</td>
<td>42 546</td>
<td>1 582 012</td>
</tr>
<tr>
<td></td>
<td>42 546</td>
<td>1 582 012</td>
</tr>
<tr>
<td>3 Expenses from ordinary activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3A Employee expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remuneration</td>
<td>7 504</td>
<td>5 737</td>
</tr>
<tr>
<td>Separation and redundancy</td>
<td>22</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>7 526</td>
<td>5 755</td>
</tr>
<tr>
<td>3B Supplier expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure by State Constructing Authorities</td>
<td>20 738</td>
<td>42 090</td>
</tr>
<tr>
<td>Project expenditure</td>
<td>21 674</td>
<td>18 542</td>
</tr>
<tr>
<td>Supply of goods and services</td>
<td>2 655</td>
<td>1 821</td>
</tr>
<tr>
<td>Operating lease rentals</td>
<td>591</td>
<td>568</td>
</tr>
<tr>
<td></td>
<td>45 658</td>
<td>63 021</td>
</tr>
<tr>
<td>3C Depreciation and Amortisation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation of motor vehicles</td>
<td>35</td>
<td>21</td>
</tr>
<tr>
<td>Depreciation of office equipment</td>
<td>79</td>
<td>65</td>
</tr>
<tr>
<td>Depreciation of computers</td>
<td>215</td>
<td>148</td>
</tr>
<tr>
<td>Depreciation of furniture, fixtures and fittings</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Depreciation of infrastructure assets</td>
<td>25 442</td>
<td>7 503</td>
</tr>
<tr>
<td>Amortisation of fitout costs</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>25 847</td>
<td>7 809</td>
</tr>
</tbody>
</table>
### 3D Interest

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on finance lease</td>
<td>26</td>
<td>31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on finance lease</td>
<td>26</td>
<td>31</td>
</tr>
</tbody>
</table>

### 3E Net gain/loss from sale of assets

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue (Proceeds) from sale</td>
<td>67</td>
<td>95</td>
</tr>
<tr>
<td>Expenses from sale</td>
<td>(68)</td>
<td>(107)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue (Proceeds) from sale</td>
<td>(1)</td>
<td>(12)</td>
</tr>
</tbody>
</table>

### 4 Financial assets

#### 4A Cash

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash on call at bank</td>
<td>21 297</td>
<td>7 088</td>
</tr>
<tr>
<td>Cash on hand</td>
<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash on call at bank</td>
<td>21 305</td>
<td>7 093</td>
</tr>
</tbody>
</table>

#### 4B Receivables

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>121</td>
<td>208</td>
</tr>
<tr>
<td>Other debtors</td>
<td>328</td>
<td>399</td>
</tr>
<tr>
<td>GST receivable</td>
<td>2 799</td>
<td>2 185</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>3 248</td>
<td>2 792</td>
</tr>
</tbody>
</table>

#### 4C Investments

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term deposits</td>
<td>18 000</td>
<td>32 000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term deposits</td>
<td>18 000</td>
<td>32 000</td>
</tr>
</tbody>
</table>

#### 4D Other financial assets

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advances to Constructing Authorities</td>
<td>888</td>
<td>888</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advances to Constructing Authorities</td>
<td>888</td>
<td>888</td>
</tr>
</tbody>
</table>
## 5 Non-financial assets ($’000)

<table>
<thead>
<tr>
<th></th>
<th>Balance 01.07.02</th>
<th>Retirements</th>
<th>Acquisitions</th>
<th>Recognised Assets</th>
<th>Balance 30.06.03</th>
<th>Balance 30.06.02</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5A Property plant and equipment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor vehicles (cost)</td>
<td>242</td>
<td>77</td>
<td>97</td>
<td>262</td>
<td>242</td>
<td></td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(32)</td>
<td></td>
<td></td>
<td>(45)</td>
<td>(32)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>210</td>
<td></td>
<td></td>
<td>217</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>Office equipment (cost)</td>
<td>531</td>
<td>168</td>
<td></td>
<td>699</td>
<td>531</td>
<td></td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(290)</td>
<td></td>
<td></td>
<td>(369)</td>
<td>(290)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>241</td>
<td></td>
<td></td>
<td>330</td>
<td>241</td>
<td></td>
</tr>
<tr>
<td>Furniture, fixtures and fittings (cost)</td>
<td>174</td>
<td>78</td>
<td></td>
<td>252</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(138)</td>
<td></td>
<td></td>
<td>(155)</td>
<td>(138)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>36</td>
<td></td>
<td></td>
<td>97</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Computers and IT equipment (cost)</td>
<td>1 292</td>
<td>235</td>
<td>240</td>
<td>1 297</td>
<td>1 292</td>
<td></td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(919)</td>
<td></td>
<td></td>
<td>(912)</td>
<td>(919)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>373</td>
<td></td>
<td></td>
<td>385</td>
<td>373</td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td>1 582 012</td>
<td>27 086</td>
<td>42 546</td>
<td>1 651 644</td>
<td>1 582 012</td>
<td></td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(7 503)</td>
<td></td>
<td></td>
<td>(32 945)</td>
<td>(7 503)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 574 509</td>
<td></td>
<td></td>
<td>1 618 699</td>
<td>1 574 509</td>
<td></td>
</tr>
<tr>
<td>Net infrastructure, plant and equipment</td>
<td>1 575 369</td>
<td></td>
<td></td>
<td>1 619 728</td>
<td>1 575 369</td>
<td></td>
</tr>
<tr>
<td>Total retirements / acquisitions</td>
<td></td>
<td>312</td>
<td>27 669</td>
<td>42 546</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

<table>
<thead>
<tr>
<th></th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5B Inventories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory of publications &amp; videos held for sale and distribution</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td><strong>5C Fitout cost</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitout</td>
<td>439</td>
<td>439</td>
</tr>
<tr>
<td>Accumulated amortisation</td>
<td>(217)</td>
<td>(156)</td>
</tr>
<tr>
<td></td>
<td>222</td>
<td>283</td>
</tr>
<tr>
<td><strong>5D Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepaid contracts</td>
<td>104</td>
<td>1 161</td>
</tr>
<tr>
<td></td>
<td>104</td>
<td>1 161</td>
</tr>
</tbody>
</table>

**6 Interest bearing liabilities**

**6A Leases**

Finance Lease Commitments

Payable

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within one year</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>In one to five years</td>
<td>229</td>
<td>315</td>
</tr>
<tr>
<td>Minimum lease payments</td>
<td>315</td>
<td>401</td>
</tr>
<tr>
<td>Deduct - future finance charges</td>
<td>46</td>
<td>73</td>
</tr>
<tr>
<td><strong>Lease liability</strong></td>
<td>269</td>
<td>328</td>
</tr>
</tbody>
</table>

Lease liability is represented by:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>65</td>
<td>60</td>
</tr>
<tr>
<td>Non-current</td>
<td>204</td>
<td>268</td>
</tr>
<tr>
<td></td>
<td>269</td>
<td>328</td>
</tr>
</tbody>
</table>

Finance lease comprises fitout of offices at 15 Moore Street.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

<table>
<thead>
<tr>
<th>7 Provisions and payables</th>
</tr>
</thead>
<tbody>
<tr>
<td>7A Employee provisions</td>
</tr>
<tr>
<td>Salaries and wages</td>
</tr>
<tr>
<td>Annual leave</td>
</tr>
<tr>
<td>Long service leave</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Current</td>
</tr>
<tr>
<td>Non-current</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>7B Suppliers</td>
</tr>
<tr>
<td>Project expenditure payable</td>
</tr>
<tr>
<td>Constructing Authority claims payable</td>
</tr>
<tr>
<td>Other creditors</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>7C Revenue received in advance</td>
</tr>
<tr>
<td>Queensland 2003-2004 contributions received in advance</td>
</tr>
<tr>
<td>Carry-over of 2002-2003 contributions to 2003-2004</td>
</tr>
<tr>
<td>Unamortised balance of lease incentive</td>
</tr>
<tr>
<td>Externally funded projects</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

8 Equity

<table>
<thead>
<tr>
<th>Item</th>
<th>Accumulated Results</th>
<th>Contribution to Assets</th>
<th>Recognition of Infrastructure Assets</th>
<th>TOTAL EQUITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance 1 July 2002</td>
<td>7 259</td>
<td>10 397</td>
<td>2 031</td>
<td>1 471</td>
</tr>
<tr>
<td>Operating Results</td>
<td>209</td>
<td>(3 138)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Equity Contributions</td>
<td>–</td>
<td>–</td>
<td>583</td>
<td>560</td>
</tr>
<tr>
<td>Balance 30 June 2003</td>
<td>7 468</td>
<td>7 259</td>
<td>2 614</td>
<td>2 031</td>
</tr>
</tbody>
</table>
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

9 Unrecognised Liabilities
The Commission is not aware of any significant unrecognised liabilities at 30 June 2003 other than those recorded in the schedule of commitments.

10 Liabilities assumed by governments
Except as indicated by these statements no liabilities have been assumed by governments.

11 Remuneration of Officers

<table>
<thead>
<tr>
<th>Income received or due and receivable by Officers</th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1 167 605</td>
<td></td>
<td>940 593</td>
</tr>
</tbody>
</table>

The number of officers included in these figures are shown below in the relevant income bands

<table>
<thead>
<tr>
<th>Number</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100,000 – $109,999</td>
<td>–</td>
</tr>
<tr>
<td>$110,000 – $119,999</td>
<td>–</td>
</tr>
<tr>
<td>$120,000 – $129,999</td>
<td>–</td>
</tr>
<tr>
<td>$130,000 – $139,999</td>
<td>2</td>
</tr>
<tr>
<td>$140,000 – $149,999</td>
<td>1</td>
</tr>
<tr>
<td>$150,000 – $159,999</td>
<td>1</td>
</tr>
<tr>
<td>$160,000 – $169,999</td>
<td>–</td>
</tr>
<tr>
<td>$170,000 – $179,999</td>
<td>1</td>
</tr>
<tr>
<td>$180,000 – $189,999</td>
<td>–</td>
</tr>
<tr>
<td>$190,000 – $199,999</td>
<td>1</td>
</tr>
<tr>
<td>$200,000 – $209,999</td>
<td>–</td>
</tr>
<tr>
<td>$220,000 – $229,999</td>
<td>1</td>
</tr>
</tbody>
</table>

“Remuneration” refers to salary, accrued leave, performance pay, employer superannuation, estimated cost of motor vehicles provided as part of a remuneration package, spouse travel entitlements and related fringe benefits tax paid during 2002–2003 for officers concerned with the management of the Office of the Commission where the total paid in respect of an individual exceeded $100,000.

12 Remuneration of Members of the Commission
Remuneration is paid to one executive member. No remuneration is paid to non-executive members who are State or Commonwealth public servants or officers of State agencies. The remuneration paid to the executive member is less than $100,000.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

13 Auditors’ Remuneration

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remuneration to be paid to Australian National Audit Office for auditing financial statements for the reporting period. No other services were provided by the ANAO.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GST Exclusive</td>
<td>27 275</td>
<td>24 930</td>
</tr>
<tr>
<td>Remuneration paid for internal auditing services during the reporting period.</td>
<td>6 414</td>
<td>5 600</td>
</tr>
</tbody>
</table>

14 Related Party Disclosures

Members of the Commission

Members of the Commission during 2002–2003 were:

- Dr. R.M. Green AO (President)
- Dr. M. Cooper
- Mr. D. Flett (To 24 February 2003)
- Mr. R. Freeman (From 17 April 2003)
- Dr. G. Gentle
- Mr. J. Hallion
- Mr. A. Holmes (To 17 April 2003)
- Mr. S. Hunter (To 30 June 2003)
- Dr. I. McPhail
- Ms. C. Munro
- Prof. L. Nelson (From 24 February 2003)
- Dr. R. Sheldrake (From 16 May 2003)
- Dr. K. Sheridan AO (To 4 July 2002)
- Dr. R. Smith (To 2 April 2003)
- Ms. J. Westacott (From 16 May 2003)
- Mr. B. Wonder

Loans to Members and Officers

No loans were made to members or officers of the Commission.
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

Transactions with Related Entities
The Murray-Darling Basin Commission is the executive arm of the Ministerial Council established by the 1992 Murray-Darling Basin Agreement. The Commonwealth and the States of New South Wales, Victoria, South Australia and Queensland are parties to this agreement whilst the Australian Capital Territory participates by a Memorandum of Understanding. Funds for activities under the direction of the Commission are paid to the Commission by the participating governments and disbursed according to Commission priorities. A high proportion of the Commission funded activity is undertaken by State agencies. All transactions are at arms length and in accordance with budgets and programs approved by the Ministerial Council.

15 Economic Dependency
The Commission is dependent on contributions by Contracting Governments to carry out its normal activities.

16 Location of Business
With the exception of assistance provided to the Mekong River Commission under AusAID funding the Commission operates solely in Australia.

17 Subsequent Events
The Commission is aware of no events subsequent to 30 June 2003 that may affect these financial statements.

18 Grants
The Commission is responsible for administering a number of grant programs on behalf of Commonwealth and state governments. Funding for these programs and responsibility for the programs rests with the various individual government bodies, consequently no disclosures have been made in relation to grant programs. Grants received during the year were for the Mekong Delta, Fish Rehabilitation and LIDAR (mapping the southern area of the Murray-Darling Basin) projects. Details of revenue and expenditure in relation to grant programs are as follows:

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$'000</td>
<td>$'000</td>
</tr>
<tr>
<td>Grants Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash available, 1 July 2002</td>
<td>651</td>
<td>693</td>
</tr>
<tr>
<td>Contributions by Government agencies</td>
<td>450</td>
<td>611</td>
</tr>
<tr>
<td><strong>Total receipts</strong></td>
<td>1101</td>
<td>1304</td>
</tr>
<tr>
<td>Payments</td>
<td>429</td>
<td>653</td>
</tr>
<tr>
<td>Cash available, 30 June 2003</td>
<td>672</td>
<td>651</td>
</tr>
</tbody>
</table>
## 19 Cash Flow Reconciliation

Reconciliation of Operating Surplus to Net Cash from Operating Activities

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating surplus / (deficit)</td>
<td>42,755</td>
<td>1,571,371</td>
</tr>
<tr>
<td>Non Cash Items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation and amortisation</td>
<td>25,847</td>
<td>7,809</td>
</tr>
<tr>
<td>(Profit) / Loss on sale of assets</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Assets recognised for the first time</td>
<td>(42,546)</td>
<td>(1,582,012)</td>
</tr>
<tr>
<td>Changes in assets and liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Increase)/decrease in receivables</td>
<td>(456)</td>
<td>(281)</td>
</tr>
<tr>
<td>(Increase)/decrease in other assets</td>
<td>1,057</td>
<td>(1,009)</td>
</tr>
<tr>
<td>(Increase)/decrease in inventories</td>
<td>(16)</td>
<td>5</td>
</tr>
<tr>
<td>Increase/(decrease) in revenue in advance</td>
<td>(662)</td>
<td>(966)</td>
</tr>
<tr>
<td>Increase/(decrease) in supplier payables</td>
<td>886</td>
<td>9,283</td>
</tr>
<tr>
<td>Increase/(decrease) in employee provisions</td>
<td>423</td>
<td>198</td>
</tr>
<tr>
<td><strong>Net Cash from Operating Activities</strong></td>
<td><strong>27,289</strong></td>
<td><strong>4,410</strong></td>
</tr>
</tbody>
</table>
# NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

## 20 Financial Instruments

### a) Terms, conditions and accounting policies

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Note</th>
<th>Accounting policies and methods</th>
<th>Nature of underlying instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial assets</td>
<td></td>
<td>Financial assets are recognised when control over future economic benefits is established and the amount of the benefit can be reliably measured</td>
<td>Funds are placed on deposit with the Commission’s banker.</td>
</tr>
<tr>
<td>Cash on call</td>
<td>4A</td>
<td>Cash is recognised at its nominal amount. Interest is credited to revenue as it accrues.</td>
<td>Funds are placed on deposit with the Commission’s banker.</td>
</tr>
<tr>
<td>Interest and Receivables for goods &amp; services</td>
<td>4B</td>
<td>The majority of the Commission’s receipts are from Commonwealth and State governments and major trading banks and the risk of non-payment is considered minimal.</td>
<td>Credit terms are net 30 days (2002: 30 days)</td>
</tr>
<tr>
<td>Investments</td>
<td>4C</td>
<td>Investments are limited to term deposits of a nature not exceeding 90 days and are recorded at cost. Interest is accrued as it is earned.</td>
<td>Term deposits are with the major trading banks and earn interest rates in line with market conditions.</td>
</tr>
<tr>
<td>Advances to Constructing Authorities</td>
<td>4D</td>
<td>Under the provisions of S72(2) of the Agreement the Commission has advanced working capital to each of the Constructing Authorities.</td>
<td>Advances are in the form of cash and are repayable on request.</td>
</tr>
<tr>
<td>Financial liabilities</td>
<td></td>
<td>Financial liabilities are recognised when a present obligation to another party is entered into and the amount of the liability can be reliably measured.</td>
<td>Financial liabilities are recognised when a present obligation to another party is entered into and the amount of the liability can be reliably measured.</td>
</tr>
<tr>
<td>Financial lease liability</td>
<td>6A</td>
<td>Liabilities are recognised at the present value of the minimum lease payments at the beginning of the lease. The discount rates used are estimates of the interest rates implicit in the lease.</td>
<td>At reporting date, the Commission had a finance lease with a term of 7 years. The interest rate implicit in the lease is 8.75%. The lease liability is secured by the leased asset.</td>
</tr>
<tr>
<td>Suppliers</td>
<td>7B</td>
<td>Creditors and accruals are recognised at their nominal amounts, being the amount at which the liabilities will be settled. Liabilities are recognised to the extent that the goods or services have been received (and irrespective of having been invoiced).</td>
<td>Settlement is usually made net 30 days.</td>
</tr>
</tbody>
</table>
b) Interest Rate Risk

The Commission’s exposure to interest rate risk and the effective weighted average interest rate for classes of financial assets and financial liabilities is set out below:

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Note</th>
<th>Floating Interest Rate</th>
<th>Fixed Interest Rate</th>
<th>Non-Interest Bearing</th>
<th>Total</th>
<th>Weighted Average Effective Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 year or less</td>
<td>1 to 5 years</td>
<td>2003</td>
<td>2002</td>
<td>2003</td>
</tr>
<tr>
<td>Financial Assets</td>
<td></td>
<td></td>
<td></td>
<td>$'000</td>
<td>$'000</td>
<td>$'000</td>
</tr>
<tr>
<td>Financial Liabilities</td>
<td></td>
<td></td>
<td></td>
<td>$'000</td>
<td>$'000</td>
<td>$'000</td>
</tr>
</tbody>
</table>
NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

c) Credit Risk Exposure
Credit Risk represents the loss that would be recognised if counterparties failed to perform as contracted. The risk on financial assets of the Commission which have been recognised on the statement of financial position, is the carrying amount net of any provision for doubtful debts.
Due to the nature of the majority of the Commission’s clients such risk is considered by the Commission to be low.

d) Net Fair Values of Financial Assets and Liabilities
The net fair values of investments have been computed at net realisable value at balance date. For other assets and liabilities, the net fair value approximates their carrying value. No financial assets or financial liabilities are readily traded on organised markets in standardised form other than investments. The aggregate net fair values and carrying amounts of financial assets and financial liabilities are disclosed in the statement of financial position and in the notes to and forming part of the financial statements.

<table>
<thead>
<tr>
<th>Note</th>
<th>2003 $'000</th>
<th>2002 $'000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total carrying amount</td>
<td>Average net fair value</td>
</tr>
<tr>
<td><strong>Financial assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash at bank</td>
<td>4A</td>
<td>21 297</td>
</tr>
<tr>
<td>Cash on hand</td>
<td>4A</td>
<td>8</td>
</tr>
<tr>
<td>Receivables for goods and services</td>
<td>4B</td>
<td>3 248</td>
</tr>
<tr>
<td>Investments</td>
<td>4C</td>
<td>18 000</td>
</tr>
<tr>
<td>Advances to constructing authorities</td>
<td>4D</td>
<td>888</td>
</tr>
<tr>
<td><strong>Total financial assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Financial liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance lease</td>
<td>6A</td>
<td>269</td>
</tr>
<tr>
<td>Accounts Payable</td>
<td>7B</td>
<td>20 488</td>
</tr>
<tr>
<td><strong>Total financial liabilities</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

21 Staffing Levels
Staffing levels at 30 June each year were: 99 85
To meet its responsibilities, the Murray-Darling Basin Commission brings together representatives from many agencies and communities in its six jurisdictions.

An indication of the range of representation is provided in the following appendices.
## APPENDIX A

### Membership of the Ministerial Council

**Members from 1 July 2002 to 30 June 2003**

### Australian Government

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Hon. Warren Truss, MP</td>
<td>Minister for Agriculture, Fisheries and Forestry (Chairman)</td>
</tr>
<tr>
<td>The Hon. Dr David Kemp, MP</td>
<td>Minister for the Environment and Heritage</td>
</tr>
<tr>
<td>Senator the Hon. Ian Macdonald</td>
<td>Minister for Fisheries, Forestry and Conservation</td>
</tr>
</tbody>
</table>

### New South Wales

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Hon. John Aquilina, MP</td>
<td>Minister for Land and Water Conservation and Minister for Fair Trading (to 2 April 2003)</td>
</tr>
<tr>
<td>The Hon. Richard Amery, MP</td>
<td>Minister for Agriculture and Minister for Land and Water Conservation, Minister for Agriculture (to 2 April 2003)</td>
</tr>
<tr>
<td>The Hon. Craig Knowles, MP</td>
<td>Minister for Infrastructure and Planning and Minister for Natural Resources (from 2 April 2003)</td>
</tr>
<tr>
<td>The Hon. Ian Macdonald, MLC</td>
<td>Minister for Agriculture and Fisheries (from 2 April 2003)</td>
</tr>
<tr>
<td>The Hon. Bob Debus, MP</td>
<td>Minister for the Environment</td>
</tr>
</tbody>
</table>
### Victoria

<table>
<thead>
<tr>
<th>Name</th>
<th>Portfolio</th>
<th>Term Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Hon. Sherryl Garbutt, MLA</td>
<td>Minister for Environment and Conservation</td>
<td>(to 3 December 2002)</td>
</tr>
<tr>
<td>The Hon. Keith Hamilton, MLA</td>
<td>Minister for Agriculture and Minister for Aboriginal Affairs</td>
<td>(to 30 November 2002)</td>
</tr>
<tr>
<td>The Hon. John Thwaites, MP</td>
<td>Minister for Environment and Minister for Water</td>
<td>(from 3 December 2002)</td>
</tr>
<tr>
<td>The Hon. Bob Cameron, MP</td>
<td>Minister for Agriculture</td>
<td>(from 3 December 2002)</td>
</tr>
</tbody>
</table>

### South Australia

<table>
<thead>
<tr>
<th>Name</th>
<th>Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Hon. John Hill, MP</td>
<td>Minister for the River Murray and Minister for Environment and Conservation</td>
</tr>
<tr>
<td>The Hon. Paul Holloway, MLC</td>
<td>Minister for Agriculture, Food and Fisheries</td>
</tr>
</tbody>
</table>

### Queensland

<table>
<thead>
<tr>
<th>Name</th>
<th>Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Hon. Stephen Robertson, MP</td>
<td>Minister for Natural Resources and Minister for Mines</td>
</tr>
<tr>
<td>The Hon. Dean Wells, MP</td>
<td>Minister for Environment</td>
</tr>
</tbody>
</table>

### Australian Capital Territory® (non-voting member)

<table>
<thead>
<tr>
<th>Name</th>
<th>Portfolio</th>
<th>Term Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Bill Wood, MLA</td>
<td>Minister for Urban Services, Minister for the Arts</td>
<td>(to 9 January 2003)</td>
</tr>
<tr>
<td>Mr Jon Stanhope, MLA</td>
<td>Minister for the Environment</td>
<td>(from 9 January 2003)</td>
</tr>
</tbody>
</table>

---

* ACT participation is through a memorandum of understanding, 27 March 1998.
## APPENDIX B

Membership of the Community Advisory Committee

Members from 1 July 2002 to 30 June 2003

<table>
<thead>
<tr>
<th>Chairman</th>
<th>Ms Leith Bouly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Member</strong></td>
<td><strong>Catchment</strong></td>
</tr>
<tr>
<td><strong>New South Wales</strong></td>
<td></td>
</tr>
<tr>
<td>Mr Les Boland</td>
<td>Gwydir</td>
</tr>
<tr>
<td>Mrs Karen Hindmarsh</td>
<td>Border Rivers (NSW)</td>
</tr>
<tr>
<td>Mr Robert Gledhill</td>
<td>Lachlan</td>
</tr>
<tr>
<td>Mr Jerry Killen</td>
<td>Namoi</td>
</tr>
<tr>
<td>Mr Daryl McGregor</td>
<td>Murray</td>
</tr>
<tr>
<td>Mrs Jenny McLellan</td>
<td>Western</td>
</tr>
<tr>
<td>Mr Peter Milliken</td>
<td>Murrumbidgee (to March 2003)</td>
</tr>
<tr>
<td>Mr Lee O’Brien</td>
<td>Murrumbidgee (from March 2003)</td>
</tr>
<tr>
<td>Mr Ian Rogan</td>
<td>Central West</td>
</tr>
<tr>
<td>Mr Mark King</td>
<td>Lower Murray-Darling</td>
</tr>
<tr>
<td><strong>Victoria</strong></td>
<td></td>
</tr>
<tr>
<td>Mr Drew English</td>
<td>North Central</td>
</tr>
<tr>
<td>Mr Rodney Hayden</td>
<td>Mallee</td>
</tr>
<tr>
<td>Mr Athol McDonald</td>
<td>Goulburn-Broken</td>
</tr>
<tr>
<td>Mr Lance Netherway</td>
<td>Wimmera</td>
</tr>
<tr>
<td>Ms Sarah Nicholas</td>
<td>North East</td>
</tr>
</tbody>
</table>
### South Australia

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr John Berger</td>
<td>Lower Mallee</td>
</tr>
<tr>
<td>Mr Leon Broster</td>
<td>Adelaide</td>
</tr>
<tr>
<td>Mrs Joanne Pfeiffer</td>
<td>Lower Murray</td>
</tr>
<tr>
<td>Mr Tony Sharley</td>
<td>Riverland</td>
</tr>
</tbody>
</table>

### Queensland

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr John Armbruster</td>
<td>Condamine</td>
</tr>
<tr>
<td>Mr Dugald Cameron</td>
<td>Warrego/Paroo</td>
</tr>
<tr>
<td>Mr Lloyd Harth</td>
<td>Maranoa/Balonne</td>
</tr>
<tr>
<td>Mr Clarrie Hillard</td>
<td>Border Rivers (Qld)</td>
</tr>
</tbody>
</table>

### Australian Capital Territory

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Peter Cullen</td>
<td>ACT Environment Advisory Committee</td>
</tr>
</tbody>
</table>

### Special interest group representatives

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Tim Fisher</td>
<td>Australian Conservation Foundation</td>
</tr>
<tr>
<td>Mr Les Gordon</td>
<td>National Farmers Federation</td>
</tr>
<tr>
<td>Mr Bruce Lloyd</td>
<td>Australian Landcare Council</td>
</tr>
<tr>
<td>Mayor Ian Mann</td>
<td>Australian Local Government Association</td>
</tr>
<tr>
<td>Mr Derek Walker</td>
<td>Indigenous representative</td>
</tr>
</tbody>
</table>
### APPENDIX C
Membership of the MDBC

**Members from 1 July 2002 to 30 June 2003**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Roy Green AO</td>
<td>Independent President</td>
</tr>
<tr>
<td><strong>Australian Government</strong></td>
<td></td>
</tr>
<tr>
<td>Mr Bernard Wonder</td>
<td>Deputy Secretary, Department of Agriculture, Fisheries and Forestry</td>
</tr>
<tr>
<td>Mr Stephen Hunter</td>
<td>Deputy Secretary, Department of the Environment and Heritage</td>
</tr>
<tr>
<td>Mr Ian Thompson (Deputy)</td>
<td>First Assistant Secretary, Department of Agriculture, Fisheries and Forestry</td>
</tr>
<tr>
<td>Dr Conall O’Connell (Deputy)</td>
<td>First Assistant Secretary, Department of the Environment and Heritage</td>
</tr>
<tr>
<td><strong>New South Wales</strong></td>
<td></td>
</tr>
<tr>
<td>Dr Kevin Sheridan AO</td>
<td>Director-General, New South Wales Agriculture (to 4 July 2002)</td>
</tr>
<tr>
<td>Dr Bob Smith</td>
<td>Director-General, Department of Land and Water Conservation (to 2 April 2003)</td>
</tr>
<tr>
<td>Ms Jennifer Westacott</td>
<td>Director-General, Department of Infrastructure, Planning and Natural Resources (from 16 May 2005)</td>
</tr>
<tr>
<td>Dr Richard Sheldrake</td>
<td>Director-General, New South Wales Agriculture (from 16 May 2003)</td>
</tr>
<tr>
<td>Mr David Harriss (Deputy)</td>
<td>Regional Director, Murray, Department of Land and Water Conservation/ Infrastructure, Planning and Natural Resources</td>
</tr>
<tr>
<td>Ms Lisa Corbyn (Deputy)</td>
<td>Director-General, Environment Protection Authority (from 16 May 2003)</td>
</tr>
<tr>
<td><strong>Victoria</strong></td>
<td></td>
</tr>
<tr>
<td>Ms Chloe Munro</td>
<td>Secretary, Department of Natural Resources and Environment (to 9 December 2002) Secretary, Department of Primary Industry (from 9 December 2002)</td>
</tr>
<tr>
<td>Mr Denis Flett</td>
<td>Chief Executive Officer, Goulburn-Murray Water (to 24 February 2003)</td>
</tr>
</tbody>
</table>
Prof Lyndsay Neilson 
Secretary, Department of Sustainability and Environment (from 24 February 2003)

Mr Denis Flett (Deputy) 
Chief Executive Officer, Goulburn-Murray Water (from 24 February 2003)

Mr Peter Sutherland (Deputy) 
General Manager, Intergovernmental & International Division, Department of Natural Resources and Environment/Sustainability and Environment

South Australia

Mr James Hallion 
Chief Executive, Primary Industries and Resources

Mr Allan Holmes 
Chief Executive, Department for Environment and Heritage (to 17 April 2003)

Mr Robert Freeman 
Chief Executive, Department of Water, Land and Biodiversity Conservation (from 17 April 2003)

Mr Peter Hoey (Deputy) 
Executive Director, Murray-Darling Division, Department of Water, Land and Biodiversity Conservation

Ms Anne Howe (Deputy) 
Chief Executive, South Australian Water Corporation

Queensland

Dr Geraldine Gentle 
Executive Director, Strategic Directions, Department of Natural Resources and Mines

Dr Ian McPhail 
Deputy Director General, Environment Protection Agency

Mr Chris Robson (Deputy) 
Executive Director, Natural Resource Sciences, Department of Natural Resources and Mines

Mr John Pollock (Deputy) 
Executive Director, Policy Analysis and Industry Development, Department of Primary Industries

Australian Capital Territory (non-voting member)

Dr Maxine Cooper 
Executive Director, Environment ACT, Department of Urban Services

Ms Elizabeth Fowler (Deputy) 
Director, Environment Protection, Environment ACT, Department of Urban Services
APPENDIX D
Membership of project boards

1 Lake Victoria Cultural Heritage
   Chair: Mr David Harriss (DepComm)
   Members: Mr Denis Flett (Comm); Mr Paul Harvey (DWLBC); Dr Conall O’Connell (DepComm); Mr Roger Perry (GM Operations, SA Water)
   MDBC Senior Officer: Mr Don Blackmore

2 Interstate Water Trading Pilot
   Chair: Mr Denis Flett (Comm)
   Members: Mr James Hallion (Comm); Mr Ian Thompson (DepComm); Mr David Harriss (DepComm); Mr Mike Smith (DLWBC); Mr Les Gordon (CAC);
   MDBC Senior Officer: Mr Scott Keyworth

3 Native Fish Management
   Chair: Mr Ian Thompson (DepComm)
   Members: Dr Geraldine Gentle (Comm)
   MDBC Senior Officer: Mr Kevin Goss

4 The Living Murray
   Chair: Mr Stephen Hunter (Comm)
   Members: Mr Peter Hoey (DepComm); Ms Leith Boully (CAC)
   MDBC Senior Officer: Mr Kevin Goss

5 Vegetation Bank
   Chair: Dr Bob Smith (Comm)
   Members: Mr Ian Thompson (DepComm); Mr Peter Sutherland (DepComm); Mr John Pollock (DepComm); Mr Peter Milliken (CAC)
   MDBC Senior Officer: Mr Scott Keyworth

6 Sustainable Rivers Audit
   Chair: Dr Conall O’Connell (Dep Comm)
   Members: Ms Lisa Corbyn (DepComm); Ms Sarah Nicholas (CAC)
   MDBC Senior Officer: Ms Jody Swirepik

7 Terrestrial Biodiversity
   Chair: Dr Ian McPhail (Comm)
   Members: Mr David Harriss (DepComm); Dr Terry Korn (NPWS, NSW); Mr Allan Holmes (DLWBC), Ms Leith Boully (CAC)
   MDBC Senior Officer: Mr Warwick McDonald

Comm = Commissioner; DepComm = Deputy Commissioner; CAC = Community Advisory Committee
APPENDIX E
Committees and working groups 2002/03

Asset Management Advisory Panel
Ad-Hoc Technical Working Group on Salt Interception
Advisory Group on Hume to Yarrawonga Waterway Management
Basin Irrigation salinity Mapping Sub-committee
Basin Salinity Management Strategy Implementation Working Group
Community Reference Panel for The Living Murray
Exchange Rates Technical Working Group
Finance Committee
Fish Passage Reference Group
Fish Working Group
Groundwater Technical Reference Group
High Level Working Group on Salt Interception
Hume-Dartmouth Technical Review Committee
Hume to Yarrawonga Land Acquisition Reference Group
Independent Sustainable Rivers Audit Group
Integrated Catchment Management Policy Committee
Integrated Catchment Management Business Program Knowledge Committee
Landscape and Industries Program Knowledge Committee
Native Fish Strategy Community Stakeholder Group
River Murray Water Advisory Board
Rivers Program Knowledge Committee
Scientific Reference Panel
Social and Economic Reference Panel
Sustainable Rivers Audit Taskforce
The Living Murray Implementation Program Working Group
Water Audit Working Group
Water Liaison Committee
Water Policy Committee
APPENDIX F
Information from the MDBC

A full list of MDBC publications can be viewed on the MDBC website at <http://publications.mdbc.gov.au/>. The following publications were produced during the 2002/03 financial year.

*Draft Native Fish Strategy for the Murray-Darling Basin 2002-2012*
  July 2002, Murray-Darling Basin Ministerial Council

*Draft Native Fish Strategy for the Murray-Darling Basin 2002-2012-Summary*
  July 2002, Murray-Darling Basin Ministerial Council

*The Living Murray-A discussion paper on restoring the health of the River Murray*
  July 2002, Murray-Darling Basin Ministerial Council

*The Living Murray-Restoring the health of the River Murray-Brochure*
  July 2002, Murray-Darling Basin Ministerial Council

*The Living Murray-Restoring the health of the River Murray-Brochure*
  January 2003, Murray-Darling Basin Ministerial Council

*Water = Life*
  October 2002, Murray-Darling Basin Commission

*Taking up the Challenge*
  March 2003, Murray-Darling Basin Commission

*Lake Victoria—A special place*
  June 2003, Murray-Darling Basin Commission

*Uncharted Waters*
  April 2003, Murray-Darling Basin Commission

*Preliminary Investigations into Observed River Red Gum decline along the River Murray below Euston*
  March 2003, Murray-Darling Basin Commission

*Groundwater Models—A community guide to better understanding*
  June 2003, Murray-Darling Basin Commission

*Settlement, erosion and muddy waters*
  March 2003, Murray-Darling Basin Commission

*Environmental implications of Drought for management of the River Murray System*
  December 2002, Murray-Darling Basin Commission
Review of Cap Implementation 2001/02
March 2003, Murray-Darling Basin Ministerial Council

Water Audit Monitoring Report 2001/02
June 2003, Murray-Darling Basin Commission

Projections of Groundwater extraction rates and implications for future demand and competition for surface water
June 2003, Murray-Darling Basin Commission

The Sustainable Rivers Audit-Assessing river health in the Murray-Darling Basin Brochure
April 2003, Murray-Darling Basin Ministerial Council

Factsheets

Water Access rights in the Murray-Darling Basin
The Murray Mouth
The Living Murray initiative
Structural works and measures for river health
Water trading in the Murray-Darling Basin
The health of the River Murray
Community engagement for The Living Murray
Climate change and environmental flows
The Snowy scheme
Environmental Flows and the Snowy River
Goulburn environmental flows study
Assessing potential ecological benefits of The Living Murray initiative
APPENDIX G
River Murray Water: assets as at 30 June 2003

Dartmouth Reservoir
Hume Reservoir
Lake Victoria
Yarrawonga Weir

Weirs and locks
No. 1 Blanchetown
No. 2 Waikerie
No. 3 Overland Corner
No. 4 Bookpurnong
No. 5 Renmark
No. 6 Murtho
No. 7 Rufus River
No. 8 Wangumma
No. 9 Kulnine
No. 10 Wentworth
No. 11 Mildura
No. 15 Euston
No. 26 Torrumbarry

Murray Mouth barrages
Goolwa
Mundoo
Boundary Creek
Ewe Island
Tauwitchere

Salt interception Schemes
Barr Creek
Mallee Cliffs
Buronga
Mildura-Merbein
Rufus River
Waikerie
Woolpunda

Forest regulators (various)
Hydrometric and Water Quality Monitoring Network
Berri Depot and Floating Plant
2002/03
The financial year from 1 July 2002 to 30 June 2003. See also water year.

Agreement
See Murray-Darling Basin Agreement.

anabranche
A branch of a river that leaves the main stream and rejoins it further downstream.

Basin
When shown with an initial capital, refers to the Murray–Darling Basin.

Basin States
The four States—New South Wales, Victoria, South Australia and Queensland—in which the Murray-Darling Basin is located. The Australian Capital Territory is also in the Basin.

blue–green algae
See cyanobacteria

Basin Sustainability Plan
A framework for planning, evaluating and reporting on natural resources management in the Basin

Community Advisory Committee (CAC)
A committee that reflects wide community interests in the use and management of the Basin’s natural resources. It advises the Ministerial Council on community issues and brings a community perspective to the work of the MDBC.

constructing authorities
See State constructing authorities.

contracting governments
The contracting governments to the Murray-Darling Basin Agreement 1992. They include the Australian Government, and the State governments of New South Wales, Victoria, South Australia and Queensland.

As the Australian Capital Territory’s participation in the Murray-Darling Basin Initiative is by memorandum of understanding (see Section 1.1) it is not a contracting government (see partner governments).
cyanobacteria
A group of bacteria containing photosynthetic pigments, often forming problematic toxic blooms. Commonly referred to as ‘blue-green algae’.

during the year
During the financial year 2002/03 (i.e. between 1 July 2002 and 30 June 2003).

EC (unit)
Electrical conductivity unit commonly used to indicate the salinity of water (1 EC = 1 microSiemen per centimetre, measured at 25°C).

ecologically sustainable
Related to using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained and the total quality of life—now and in the future—can be increased.

entitlement flows
Minimum monthly River Murray flows to South Australia, as detailed in the Agreement.

gigalitre (GL)
One thousand million or $10^9$ litres.

groundwater
The water in the saturated pores of soil or rock below the watertable.

Initiative
See Murray-Darling Basin Initiative.

integrated catchment management
A process through which people can develop a vision, agree on shared values and behaviours, make informed decisions and act together to manage the natural resources of their catchment. Their decisions on the use of land, water and other environmental resources are made by considering the effect of that use on all those resources and on all people within the catchment.

irrigation season
The period in which major irrigation diversions occur, usually starting in August/September and ending in April/May.

Ministerial Council
See Murray-Darling Basin Ministerial Council.
Murray-Darling 2001  
A multi-partner funding program delivered through the Natural Heritage Trust.

megalitre (ML)  
One million or $10^6$ litres (1 ML is about half the volume of an Olympic-sized swimming pool).

*Murray-Darling Basin Agreement (Agreement)*  
The agreement between the contracting governments (see *Introduction to Section 1*). The current *Agreement* is also known as the 1992 *Agreement*.

Murray-Darling Basin *Initiative (Initiative)*  
Partnership of governments and community formed to enhance the environmental resources of the Murray-Darling Basin (see *Introduction to Section 1*).

Murray-Darling Basin Ministerial Council (Ministerial Council)  
Ministers holding land, water and environment portfolios in each contracting government. A Minister of the Australian Capital Territory Government also participates under the terms of a memorandum of understanding described in Section 1.1.

Natural Heritage Trust  
The Australian Government established the Natural Heritage Trust in 1997 to fund environmental protection, sustainable agriculture and natural resources management.

*Natural Resources Management Strategy*  
The overarching strategy of the Murray-Darling Basin *Initiative* (see Section 4.2).

off-allocation  
Use, or a period of use, of water by irrigators when the use is not counted against an irrigator’s allocation. Periods of off-allocation for a given reach of a waterway are sometimes declared by a regional water authority when unregulated tributary flows or spills from storages produce a flow that is above the total downstream requirements for that reach.

out-of-balance  
Used in tables to describe water held in storage by Victoria and New South Wales. It describes the difference in the volumes of water held in reserve in MDBC storages for later use by those two States.

Traditionally, because of Victoria’s greater involvement in irrigation activities such as horticulture and dairying—as opposed to annual crops—Victoria has held more water in reserve than New South Wales.
overdraw
Borrowing next season’s water from reserves, for use during the current season.

partner governments
The governments involved in the Murray-Darling Basin Initiative. They are the Australian Government and governments of New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory (see also contracting governments).

rain-rejection flows
Increased downstream flows caused when water is ordered by an irrigator but not used due to rain falling between time of release of water from storage and its arrival at the point of use.

riparian
Of, inhabiting or situated on the bank and floodplain of a river.

River Murray system
The river system defined in Section 3.2.

River Murray Water
An internal business unit of the MDBC responsible by specific delegation for exercising the MDBC’s functions for water and asset management.

salinity
The concentration of dissolved salts in groundwater or river water, usually expressed in EC units or milligrams of total dissolved solids per litre. The conversion factor is variable but generally 0.6 mg/L = 1 EC.

sales water
An allocation of water beyond the basic water allocation (or water right), that is available at a different price from the basic water allocation.

salinity credits
Accounting units for the Salinity and Drainage Strategy. Credits are obtained through measures that reduce the salinity of the River Murray.

Strategic Investigations and Education Program (SI&E)
The MDBC’s funding program to support knowledge generation (see Sections 4.4 and 6.1).
sleeper licence
An allocation of water to a user that has not been used in the past.

State constructing authorities
The New South Wales Department of Sustainable Natural Resources,
Goulburn-Murray Water; and the South Australian Water Corporation.

surcharge
Water in a lake or reservoir above the nominal full supply level of the
storage.

water right
The basic water entitlement or allocation to an individual water user.

watertable
The surface below which the pores and fissures of the soil or rock are
saturated with water.

water year
In relation to the Snowy Mountains Scheme, the 12 months from 1
May to 30 April. In relation to the River Murray system, the 12 months
from 1 June to 31 May.
REFERENCES


Prime Minister’s Science, Engineering and Innovation Council (PMSEIC) 2002, *Sustaining our natural systems and biodiversity*, Canberra.
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Hume Catchment
~50% burnt (in total)
~30% burnt (ex Dartmouth)

Ovens Catchment
~20% burnt

Kiewa Catchment
~20% burnt

Dartmouth Catchment
~90% burnt

Lake Mulwala
Corowa
Albury
Hume Reservoir
Tallangatta
Tallandoon
Mitta Mitta
Kiewa River
Ovens River
River Murray
Dartmouth Reservoir

Main towns
Water bodies
Rivers
Catchment boundaries