



Review of Cap Implementation 2003/04

Report of the Independent Audit Group



Integrated catchment management in the Murray–Darling Basin

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.

Our values

We agree to work together, and ensure that our behaviour reflects the following values.

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, including Indigenous communities, and ensure 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 decision-making.
- We will take a Basin perspective and a non-partisan approach to Basin management.

Respect and honesty

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

Flexibility

- We will accept reform where it is needed, be willing to change, and continuously improve our actions through a learning approach.

Practicability

- We will choose practicable, long-term outcomes and select viable solutions to achieve these outcomes.

Mutual obligation

- We will share responsibility and accountability, and act responsibly, with-fairness and justice.
- We will support each other through necessary change.

Our principles

We agree, in a spirit of partnership, to use the following principles to guide our actions.

Integration

- We will manage catchments holistically; that is, 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.

Accountability

- We will assign responsibilities and accountabilities.
- We will manage resources wisely, being accountable and reporting to our partners.

Transparency

- We will clarify the outcomes sought.
- We will be open about how to achieve outcomes and what is expected from each partner.

Effectiveness

- We will act to achieve agreed outcomes.
- We will learn from our successes and failures and continuously improve our-actions.

Efficiency

- We will maximise the benefits and minimise the costs of actions.

Full accounting

- We will take account of the full range of costs and benefits, including economic, environmental, social and off-site costs and benefits.

Informed decision-making

- We will make decisions at the most appropriate scale.
- We will make decisions on the best available information, and continuously improve knowledge.
- We will support the involvement of Indigenous people in decision-making, understanding the value of this involvement, and respecting the living knowledge of Indigenous people.

Learning approach

- We will learn from our failures and successes.
- We will learn from each other.

Review of Cap Implementation 2003/04

Report of the Independent Audit Group



Independent Audit Group Members

Dr Wally Cox (Chair)
Paul Baxter

M A R C H 2 0 0 5

Published by Murray-Darling Basin Commission

Postal Address GPO Box 409, Canberra ACT 2601
Office location Level 5, 15 Moore Street, Canberra City
Australian Capital Territory

Telephone (02) 6279 0100 international + 61 2 6279 0100
Facsimile (02) 6248 8053 international + 61 2 6248 8053
E-Mail info@mdbc.gov.au
Internet <http://www.mdbc.gov.au>

For further information contact the Murray-Darling Basin Commission office on (02) 6279 0100

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The Independent Audit Group appreciated the cooperation of State and Territory Government agencies and the Murray-Darling Basin Commission.

The implementation of the Cap continues to challenge the ingenuity and resources of Government administrators.

Information continues to be freely provided and the issues and the options for resolving them were discussed openly.



Auditors' Foreword

March 2005

The Hon. Warren Truss MP
Chairman
Murray-Darling Basin Ministerial Council
Parliament House
CANBERRA ACT 2600

Dear Minister

We have pleasure in submitting to you our *Review of Cap Implementation 2003/04*.

Council established the Cap in 1995 and set the operating framework in 1996.

There has been considerable progress in implementing the Cap, however as of October 2004 Cap arrangements have still not been finalised by the ACT and Queensland and for the Border Rivers within New South Wales.

Development of, and calibration of models for predicting annual diversions as a basis of comparing with actual diversions and Cap compliance are critical to successful Cap implementation.

In the view of the IAG while there has been considerable progress, resourcing of Cap implementation in NSW is inadequate to achieve timely Cap implementation. As a consequence the IAG is unable to report on Cap compliance for a number of NSW valleys including the Gwydir. This in turn is affecting the credibility of the whole Cap process in the eyes of key stakeholders. It would, in the view of the IAG, be highly desirable if Commission resources were to be made available to finalise the framework in NSW.

Yours sincerely



DR WALLY COX
Chairman



PAUL BAXTER
Member





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Executive Summary

Following the adoption of Schedule F by the Council for operationalising, monitoring and reporting on Cap implementation, this audit was conducted in line with the requirements of Clause 13 of the Schedule.

The 2003/04 audit identified progress in each of the States and the ACT in establishing and/or operationalising the Cap. There is however a number of strategic issues that need to be addressed. Some of these have been raised in previous reports but remain unresolved. The issues are:

- the establishment of Cap targets in Queensland, New South Wales and the ACT;
- measurement of diversions; and
- accreditation of models for Cap assessment.

Work is progressing in Queensland and the ACT to establish Cap targets, and in New South Wales establishing Cap targets for the Macquarie River valley and Border Rivers and reviewing Cap targets for the Gwydir. In Queensland, Water Resource Plans for the Border Rivers, Moonie and Paroo/Warrego/Nebine became law in December 2003 and for the Condamine-Balonne in August 2004. Draft Resource Operations Plans for the Moonie, Paroo/Warrego/Nebine were expected to be released for public consultation in December 2004 and finalised by July 2005. Preparation for Resource Operations Plans for the Border Rivers and Condamine-Balonne has commenced. These plans provide the basis for the establishment of valley Caps. These are unlikely to be in place before 2006/07. Finalisation of the Resource Operations Plan for the Border Rivers is dependent on finalisation of an Inter-Governmental Agreement between Queensland and New South Wales to establish water sharing and environmental flow rules. The IAG notes that there has been progress in addressing these issues but considers that discussions need to be finalised as a matter of priority to enable Cap targets for the Queensland and New South Wales Border Rivers to be established.

The IAG recommends that Queensland and New South Wales finalise the Inter-Governmental Agreement and establish the framework to enable Cap targets to be established. If negotiations falter, either the Murray-Darling Basin Commission or an independent facilitator should be asked to facilitate resolution of outstanding issues.

Finalisation of a Cap for the ACT is dependent on the establishment of a water trading framework including rules, exchange rates,

recording of entitlements and Cap adjustments. The IAG understands discussions have commenced between the ACT and New South Wales representatives. These should be finalised to enable a Cap to be established for the ACT.

The IAG recommends that the ACT and New South Wales representatives finalise discussions on a framework for trade to enable the ACT to finalise its Cap.

In New South Wales there has been considerable progress in developing models to enable auditing of Cap compliance. New South Wales' ability to finalise these models is heavily constrained by lack of resources.

The IAG recommends that additional resources be provided to enable New South Wales to finalise the models for its valleys. The Murray-Darling Basin Commission should consider making resources available as the current rate of progress is reducing the credibility of Cap implementation across the Basin.

In 2002/03 the IAG recommended that each State and the ACT, where relevant, submit valley models for independent verification with a view to 50% of models being accredited by 30 June 2004 and 100% compliance by 30 June 2005. The 30 June 2004 target has not been met although a number of models have been submitted for audit.

As Cap compliance is determined by comparing diversions against modelled targets, it is essential that the models be independently verified and accredited and that any model changes be logged in the MDBC register.

In light of the Queensland time frame for developing its Resource Operations Plans the IAG recommends that South Australia and Victoria have all models accredited by 30 June 2005, New South Wales by June 2006 and Queensland by June 2007.

The IAG has previously raised the issue of the need for Quality Management Systems for the measurement, collation and reporting of diversions as well as trade. The Marsden Jacobs report "Audit of Cap Data Management Systems" provides further evidence that a more formal approach is required.

The IAG supports the recommendation that an updated Data Management Systems Protocol be developed. The Marsden Jacobs report also raises many other issues in relation to lack of consistency within and between states in measuring, recording and reporting on



diversions. As this information provides the foundation for management of water resources as well as the basis for trade, the IAG commends the Marsden Jacobs report to the Commission with a view to developing a more consistent and rigorous framework. While a 'nuts and bolts' issue it affects stakeholders' confidence in the successful implementation of the Cap across the Basin.

The conclusions and recommendations reached by the Audit Group for the 2003/04 year by State and Territory are:

South Australia

- Diversions in 2003/04 were heavily constrained as a result of restrictions and were within the annual Cap targets for metropolitan Adelaide and Country Towns; within the trade-adjusted Cap for the Lower Murray Swamps; and within the trade and climate-adjusted annual Cap for Highland.
- South Australia has a reliable system, which continues to improve, for urban and irrigation use.
- A new Water Information and Licensing Management Application (WILMA) has been introduced.
- South Australian 'All other Uses' Cap model has been approved by the Commission in November 2004, the second such model to achieve that distinction.
- A proposal has been submitted to the IAG for the consideration of metropolitan Adelaide growth and associated water management and accounting within the Cap framework. The IAG will prepare a response to this 'out-of-session'.



Victoria

- Diversions for the Murray/Kiewa/Ovens Valley, Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee were all below annual climate and trade-adjusted Cap targets.
- Cumulative diversions for all valleys are in credit.
- Accreditation of the Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee models is expected by July 2005.
- Bulk water entitlements for Broken, Ovens and Loddon will be finalised by July 2005.
- Significant progress has been made in the preparation of Stream Flow Management Plans for unregulated rivers. Diversion from these rivers is minor compared to regulated sources.

New South Wales

- Diversions in 2003/04 were 4105 GL compared to 4132 GL in 2002/03.
- IQQM Cap models have now been prepared for all river valleys, with the exception of the Murray and the Peel Rivers. However, these models require further recalibration prior to final approval under Schedule F.
- The Lachlan IQQM model has been approved by the Murray-Darling Basin Commission under the Schedule F procedures. The experience of the extended period of drought has raised the question as to whether changed operational behaviour during such periods of prolonged drought should be included within Cap models as well as current conditions modelling.
- The preliminary Schedule F accounting for the 1997/98 - 2003/2004 period indicates that diversions in the combined Barwon-Darling and Lower Darling Valleys are cumulatively 124 GL above Cap, and above the combined trigger for Special Auditing of 62 GL. Therefore a Special Audit is required for this valley.
- The Gwydir cumulative debit as at 2002/03 was 29 GL and technically no longer exceeds the trigger for a Special Audit. However, Cap estimates could not be prepared for 2003/04 because of the need for model recalibration. While it is considered that the Gwydir will not have exceeded the Cap trigger, the IAG cannot provide advice which can be corroborated by IQQM modelling.
- The IAG has been unable to assess the Cap compliance of the NSW Border Rivers because the Cap has not been defined in that

valley. The IAG expresses concern that the Border Rivers will be found to be in breach once a Cap is defined.

- The Cap trigger has not been exceeded for other valleys in NSW, although further recalibration work on the relevant models is required to confirm this observation.
- NSW should redouble its efforts to assign appropriate additional resources to the verifying and obtaining of data to allow the IQQM models used in the State to be reassessed, refined and recalibrated as appropriate.
- NSW should also announce a program of verification of meter readings by the largest off-takes and licenced water diverters in the State.
- Upon completion of the Integrated 1993/94 and current conditions model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam.
- The IAG encourages NSW to complete negotiations with the ACT over trading rules and other related matters in order to allow a Cap for the ACT to be defined.
- NSW should submit a monitoring report on the Intersecting Streams as required under Schedule F.

Queensland

- Diversions are estimated at 804 GL and are the highest recorded since 1993/94. This was in a year with average rainfall and flow and reflects the very large increase in water storage capacity.
- Growth in off-stream storages stopped since the introduction of a moratorium on construction in September 2000 and remains at 1878 GL.
- The Water Resource Plans for the Border Rivers, Moonie and Paroo/Warrego/Nebine became law in December 2003 and for Condamine-Balonne in August 2004.
- Draft Resource Operations Plans for the Moonie and Warrego/Paroo/ Nebine are expected to be available for public consultation in December 2004 with a view to finalisation by July 2005. Preliminary work has commenced on the Resource Operations Plans for the Border Rivers and Condamine-Balonne.

- Finalisation of the Border Rivers Resource Operations Plan is dependent on the outcome of negotiations under the Inter-Governmental Agreement between Queensland and New South Wales and these should be finalised expeditiously to enable Caps to be established for both the Queensland and New South Wales Border Rivers.
- Queensland will have good estimates of diversions as the strategy has been developed and resourced to measure water diversions through meters except for overland flows.
- Queensland is developing Resource Operations Plan models and it is recommended that these be submitted for audit and subsequent accreditation. These models should allow auditing of compliance against Cap targets as in other states, and progress against end-of-valley flow or environmental objective targets.
- A Cap for valleys in the Queensland portion of the Basin are expected to become progressively available over 2005/06 and 2006/07.

Australian Capital Territory

- No Cap presently exists for the ACT.
- Net diversions of 27.8 GL in 2003/04 are below the average usage between 1989 and 2001 of 31 GL and are also less than a climate-adjusted annual Cap target of 42 GL. The ACT would have a cumulative credit of 49 GL if the Cap of 38 GL proposed by the IAG had applied since July 1997.
- The IAG encourages the ACT and NSW to complete their negotiations on the form of a Cap to apply to the ACT and the surrounding region.
- The IAG supports the concept of the ACT Cap being seen in the context of a wider valley Cap, and notes the implications of this on the current review of the need for, and form of, additional water capture arrangements for the ACT.





1. Introduction

In November 1996, the Independent Audit Group (IAG) submitted its report *Setting the Cap* (the IAG Report) to the Murray-Darling Basin Ministerial Council (the "Council"). This report addressed a number of issues arising out of the Council's decision to introduce an immediate moratorium on further increases in diversions of water from the rivers of the Murray-Darling Basin, and cap the future level of diversions.

The Council, in finalising Schedule F, agreed that the IAG should have an ongoing role in auditing the implementation of the Cap.

The Council has also asked the IAG to review the Queensland Water Resource Planning process, and in time the outcomes of the process. This process, which involves significant community participation in both Queensland and northern NSW, was due for completion about the middle of 1998 but has been delayed. It will be the foundation for determining the balance in Queensland between consumptive and in-stream use, and the Council has supported the auditing of both the process and outcomes.

Thus the Review of Cap Implementation 2003/04 by the IAG has been prepared in response to the Council's request and is based upon information made available to the IAG by each of the States and the ACT. The report sets out the broad background to the review and the process used by the IAG in forming its views and final conclusions. It then comments on the current status of compliance with the Cap in each of the five jurisdictions involved. It should be noted that Cap targets for the ACT, Queensland and Border Rivers within New South Wales are still to be established.

The IAG team wishes to thank all States and the ACT for their cooperation in making both the data and officers available and for the open and frank way in which the review was conducted. The IAG also wishes to acknowledge the assistance provided by the officers of the Murray-Darling Basin Commission (MDBC) in the preparation of this report. The findings however are entirely those of the IAG.



2. Background

The Council at its June 1995 meeting decided to introduce a Cap on diversion of water from the Murray-Darling Basin. A Cap on the volume of diversions associated with the 1993/94 level of development was seen as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive uses.

The two primary objectives driving the decisions to implement the Cap were:

1. to maintain and, where appropriate, improve existing flow regimes in the waterways of the Murray-Darling Basin to protect and enhance the riverine environment; and
2. to achieve sustainable consumptive use by developing and managing Basin water resources to meet ecological, commercial and social needs.

The adopted definition of the Cap on diversions, leaving aside equity issues, is:

The Cap is the volume of water that would have been diverted under 1993/94 levels of development.

In unregulated rivers this Cap may be expressed as an end-of-valley flow regime

with the following criteria:

- to protect water quality and preserve the health of the river system, the Cap should ensure there is no net growth in diversions from the Murray-Darling Basin;
- the level of development against which to test for growth in water diversions be equivalent to 1993/94 levels of development;
- under the Cap, the amount of water that States would be entitled to divert from regulated streams in any year would be quantified using analytical models that incorporate weather conditions and which take into account:
- the water supply infrastructure in place in 1993/94;
- the water allocation and system operating rules which applied in 1993/94;
- the entitlements that were allocated and the extent of their utilisation at 1993/94 levels of development;

- the underlying level of demand for water in 1993/94; and
- the system operating efficiency in 1993/94; and
- in unregulated rivers, end-of-valley flows may be used to define the Cap using analytical models incorporating the same points as above.

The Council also acknowledged that:

- for South Australia, Victoria, and New South Wales, Cap management will be in accordance with the agreed outcomes as specified by the Cap definition above;
- for the ACT, the Cap will be defined following a review by the IAG and negotiations with the ACT Government; and
- for Queensland, any final agreement for the targeted outcomes will need to await the completion of the Water Allocation and Management Planning (WAMP) (now called Water Resource Plans - WRP) process being undertaken by that State, the outcome of which will be subject to consideration by the Council.

For Queensland, the Council has agreed that the WRP process should ensure that Queensland balances consumptive and in-stream use. The IAG has supported the WRP process noting that:

- it must accommodate in-stream use not only in Queensland but also in the Border Rivers under the control of the Border Rivers Commission and the rest of the Murray-Darling Basin;
- a management regime needs to be developed that includes pricing, property rights and measuring and reporting;
- the WRP be fully implemented, including assessment of downstream impacts in NSW;
- the Precautionary Principle be applied through the establishment of an allocation to be held in reserve to minimise the risk of over allocation for consumptive use; and
- the final independent audit of the WRP process is conducted, including modelling of impacts on downstream Basin flows.

After considering a number of equity issues, the Cap may be adjusted for certain additional developments, which occurred after 1993/94.

The Cap should restrain diversions, not development. With the Cap in place, new developments should be allowed, provided that the water for them is obtained by improving water-use-efficiency or by purchasing water from existing developments.

Because irrigation demand varies with seasonal conditions, the diversions permitted under the Cap will vary from year to year. The system used to manage diversions within the Cap will therefore need to be flexible.

In Queensland for unregulated rivers with high seasonal variability, the Council agreed that the Cap may be described in terms of end-of-valley flows and supporting flow management rules including diversion entitlements until December 2002. After this the Cap in Queensland, as in all other States and the ACT, was to be specified as diversion limits on a valley by valley basis. A Cap for Queensland rivers is yet to be determined.

The 2002/03 Review of Cap Implementation identified that:

- Caps were still to be finalised for the ACT, Queensland and Border Rivers of New South Wales;
- Diversions for South Australia were within the annual Cap target for metropolitan Adelaide and the irrigation areas, but marginally higher for Country Towns;
- Diversions for the Goulburn/Broken/Loddon were above and diversions from the Murray/Kiewa/Ovens, Campaspe and Wimmera-Mallee were below the climate-adjusted annual Cap targets;
- Diversions from the Lower Darling, Namoi/Peel, Lachlan and NSW Murray exceeded the annual climate-adjusted Cap. The Barwon-Darling, Gwydir and Murrumbidgee were within Cap. The IAG was unable to assess the Cap compliance for the Macquarie Valley as the Cap target was not available;
- The Lachlan exceeds the trigger for a Special Audit;
- NSW should as a matter of urgency, assign appropriate additional resources to the verifying and obtaining of data to allow the IQQM models to be reassessed, refined and recalibrated as appropriate;
- In the ACT net diversions of 40.1 GL exceeded the average usage between 1989 and 2001 of 31 GL, but was less than a possible climate-adjusted annual Cap target for net diversions of 48.7 GL;
- In Queensland diversions were estimated at 212GL, the second lowest since 1993/94;
- Water Resource Plans for the Border Rivers, Moonie and Paroo/Warego/Nebine became law in December 2003 and a revised draft Water Resource Plan for the Condamine/Balonne was released for public comment in December 2003;
- Each State and the ACT should, where relevant, submit valley models for independent verification with a view to 50% of the models being accredited by 30 June 2004 and 100% compliance by 30 June 2005.





3. Audit Process

For the purposes of this 2003/04 audit of progress with the implementation of the Cap, the IAG has adopted a consultative approach designed to:

- clarify expected Cap outcomes for each State;
- gather available statistical information on actual levels of diversions in 2003/04 as a means of quantifying overall diversions and commenting on Cap compliance;
- identify progress made in implementing the proposed management rules for capping water diversions;
- highlight particular problems being encountered by the relevant jurisdictions as regards the finalisation or implementation of the management rules; and
- update the status of the Queensland Water Resource Plans and finalisation of Cap figures for the ACT, Queensland and the Border Rivers in New South Wales.

The IAG met with representatives of each of the States and conducted a telephone conference with ACT representatives during the period 26 to 28 October 2004. The format of each meeting was to compare water usage in 2003/04 with Cap targets, to discuss progress with the establishment of models and management frameworks to achieve targets, and to discuss issues of possible concern.

The IAG drafted its observations and conclusions on progress within each State and the ACT and then invited the States concerned and the ACT to make comments of a factual nature upon the IAG's findings. These observations on factual points were then considered by the IAG prior to finalising the report.

While acknowledging the valuable contribution made by each of the States, the ACT and the members of the MDBC staff, the findings and conclusions presented in this report are entirely those of the IAG.



4. Audit of 2003/04 Cap Implementation

4.1 South Australia

4.1.1 The Cap

As a result of decisions by the Ministerial Council in December 1996 and March 2001 and the finalisation of Schedule F, the components of the South Australian Cap unadjusted for trade are:

- a five-year rolling non-tradeable allocation of 650 GL for metropolitan Adelaide;
- a tradeable allocation of 50 GL per year for country towns;
- an allocation of 103.5 GL per year for the lower Murray Swamps with the following components:
 - 9.3 GL per year for highlands with unrestricted trade;
 - 72 GL per year for swamp use with unrestricted trade; and
 - 22.2 GL per year non-tradeable environmental entitlement
- an average of 440.6 GL per year for Other uses in South Australia which is tradeable.

4.1.2 2003/04 Usage

South Australian diversions in 2003/04 were within the annual Cap targets for metropolitan Adelaide and Country Towns. Diversions for Lower Murray Swamps were under the trade-adjusted target and Other Diversions under both trade and climate adjusted. All remain in cumulative Cap credit (Table 1).

4.1.3 Administration of the Cap

South Australia continues to be well placed to manage the Cap. Water diverted from the Murray River for urban use is reliably measured and licences have been issued to SA Water for an allocation of 50 GL per year for country urban water and a non-tradeable 650 GL over a rolling five-year period for Adelaide.

The issue of Quality Assurance is being addressed. Licensing and diversion data have been audited, a Water Licensing Manual documents processes and a new software package has been developed (WILMA - Water Information and Licensing Management Application). It has been used since 1 July 2004.



Table 1: South Australian Diversions for 2003/04 (GL)

	Long-Term Cap Adjusted for Permanent Trade	Adjustment to Cap as a Result of Temporary Trade	Diversion	Cap Credits (Cap Target less diversion)		
				2003/04	Cumulative since 1 July 1997	20% Schedule F Trigger
Adelaide						
- current year	—	—	82	—	—	—
- rolling 5 years	650	+23	571.5	78.5	—	—
Country towns	50	—	35.2	14.8	71.1	-10
Reclaimed Swamps	86.8	-5.9	80.9	—	—	-17.4
All Other Uses	495.9+	+10.3	413.2	93	378*	-99.2

+ 2003/04 is the first time a climate-adjusted Cap has been used.

* Cumulative Cap credits have been adjusted for 2003/04 only using the climate-adjusted Cap model.

A Cap model for calculating the climate-adjusted annual Cap target for SA's "All other Uses" (commonly called Highland irrigation) has been developed. Following recommendation from the Independent Auditor of Cap models, this model has been approved by the Murray-Darling Basin Commission in November 2004 as a Cap model under Schedule F, the second such model to achieve that distinction.

Due to severe drought, predicted early season flows down the River Murray into South Australia were significantly less than entitlement flows. As a consequence allocations were reduced to 65% of normal for Highland, Country Towns and Adelaide, with a reduction in the number of irrigation applications for the Lower Murray Swamps. This was relaxed to 95% late in the season.

As a consequence there was a significant increase in trading with net 12.1 GL of permanent trade and 5.9 ML of temporary trade into the Highland from intrastate and 12 GL of permanent and 5.9 ML of temporary trade out of the Lower Murray Swamps.

Interstate net permanent trading of 503 ML out of South Australia in 2003/04 compares to 843 ML in 2002/03. A preliminary estimate of net interstate temporary trade in 2003/04 of 4.4 GL compares with 9 GL of temporary trade moving out in 2002/03.

For permanent interstate trade only, the South Australian Cap increases or decreases by 0.9 GL for every 1 GL traded into or out of the State.

South Australia, through SA Water, transports water from the Murray to other Basins, i.e., Barossa Valley, Clare Valley. The IAG supports the accounting of diversions and trades as specified in Schedule F and notes that South Australia debits this against the originating allocation.

A temporary trade of 12 GL in 2001/02 and a further temporary trade of 11 GL in 2002/03 was made from Country Towns to metropolitan Adelaide. There were no trades into metropolitan Adelaide in 2003/04.

4.1.4 Monitoring and Reporting

The IAG was advised that a modified computer based system for licensing and monitoring of water use (WILMA) will provide the basis for reporting water use in the future.

Urban consumption (metropolitan Adelaide and Country Towns) and irrigation consumption in the Highland "All Other Uses" rehabilitated

irrigation areas are reliably metered (97% metered). Complete rehabilitation was achieved in the Highland region during the 2003/04 water year. The last area to be rehabilitated was the Loxton district and this has now been achieved. South Australia continues to make improvements to ensure that the standard of metering of direct diversions is maintained at satisfactory levels.

Metering diversions from the Lower Murray Swamps is currently underway as part of a comprehensive rehabilitation program in that region.

4.1.5 Proposals to Refine Implementation in 2004/05

South Australia will continue to improve its capacity to manage to Cap targets. In particular it is proposed to finalise a water management and allocation system, including direct measurement of water supply, for the Murray Swamps.

4.1.6 IAG Assessment

Consumption in South Australia in 2003/04 was heavily constrained as a result of significant below average river flows. Diversions for Country Towns and Adelaide were below Cap and diversions for Highland and Lower Murray Swamps were below trade and climate-adjusted Cap for Highland and trade-only-adjusted Cap for Lower Murray Swamps respectively.

metropolitan Adelaide consumption over the last five years was 571.5 GL compared with the target of 650 GL.

SA Water has raised the issue of provision of additional water for Adelaide over and above the water it holds against licences in other areas which is transported through SA Water infrastructure.

The rolling target of 650 GL over a five-year period for metropolitan Adelaide assumes a 99% reliability of water supply for Adelaide. Any growth in consumption arising from a growth in demand or reduced yield from the Adelaide catchments will reduce the reliability of supply unless additional water is purchased from other users and transferred as permanent Cap.

This issue was addressed in part in the IAG's 2002/03 report with in-principle agreement that:

- the 12 GL in 2001/02 and 11 GL in 2002/03 temporary transfers would be recognised

for use against metropolitan Adelaide consumption;

- a separate licence is to be maintained for any water traded to the Adelaide system;
- first water used each water-year to metropolitan Adelaide should be accounted as use by the separate licence; and
- reporting should be in accordance with Clause 11 of Schedule F.

A formal submission has now been received from the Department of Water, Land and Biodiversity Conservation. It proposes the following principles:

- *For areas supplied with water extracted under the Metropolitan Adelaide Cap, growth in consumer demand beyond that existing in the year 2000 will be provided for separately to the original cap of 650 GL over 5 years. This is inline with the IAG recommendations in the 1996 report "Setting The Cap" (recommendation 32, page xiv).*
- *Growth in demand from the River Murray will be assessed by reference to the total demand in the area supplied by the Swan Reach – Stockwell, Mannum – Adelaide and the Murray Bridge – Onkaparinga pipelines, taking account of changes in yield and access to resources for urban use from the Mount Lofty Ranges Catchments.*
- *The growth component will be accounted for under a separate 'first use' licence. Water extracted for Adelaide will be assumed to be used firstly from this licence with the balance being accounted against the original Cap licence.*
- *The full volume of the allocation on the 'first use' licence as at 30 June in any water-year will be utilised to account for the growth component.*
- *Water can be traded in or out of the 'growth' licence provided that the cumulative volume of allocation provided under this licence (measured at 30 June in each water-year) equals or exceeds the growth requirement. South Australia will report on this annually as part of the cap reporting.*
- *The estimate of growth will be reviewed every five years, but where appropriate the review may take into account more than just the previous five years data.*

The IAG will prepare a response to the South Australian submission with a view to finalising this issue. A full report will appear in the 2004/05 IAG report.

South Australia remains best placed of all the States to quantify the Cap and reliably report against it.

Reliable consumption measurement is in place for both SA Water and the rehabilitated

Highland irrigation areas with improvements projected for the Lower Murray Swamps.

The IAG again commends South Australia for the work that has been done in implementing the Cap and putting in place the necessary administrative framework.

4.1.7 Conclusions/Recommendations

- Diversions in 2003/04 were heavily constrained as a result of restrictions and were within the annual Cap targets for metropolitan Adelaide and Country Towns; within the trade-adjusted Cap for the Lower Murray Swamps and the trade and climate-adjusted annual Cap for Highland.
- South Australia has a reliable system, which continues to improve, for urban and irrigation use.
- A new Water Information and Licensing Management Application (WILMA) has been introduced.
- South Australian 'All other Uses' Cap model has been approved by the Commission in November 2004, the second such model to achieve that distinction.
- A proposal has been submitted to the IAG for the consideration of metropolitan Adelaide growth and associated water management and accounting within the Cap framework. The IAG will prepare a response to this 'out-of-session'.



4.2 Victoria

4.2.1 The Cap

Victoria is using computer simulation models, calibrated to 1993/94 level of development, to calculate annual Cap targets for the major regulated systems. Regression models are being used for the smaller systems.

A preliminary review of the model used to calculate Cap targets for the Goulburn/Broken/Loddon and Campaspe valleys has been undertaken by the model auditor. However, modifications and improvements to the model are still being made and these are to be completed before the final model review. These improvements have arisen primarily during the course of the Loddon Bulk Entitlement conversion process, and through modelling of the Broken River as part of the study investigating the decommissioning of Lake Mokoan. The model has also been modified to allow pumping from Waranga Basin, as occurred in 2003. Revised documentation of model assumptions and final calibration results are being prepared as required by the auditor. This interim model has been used to calculate the 2003/04 Cap targets and the cumulative credits since 1997/98.

The model used to calculate the Murray component of the Murray/Kiewa/Ovens valley Cap target is being re-calibrated by the MDBC to reflect revised estimates of historical diversions. An interim version of this model has been used to calculate the 2003/04 Murray component of the Cap target. Regression relationships with rainfall and temperature have been developed by the MDBC to calculate the Kiewa and Ovens components of the Cap targets. The three models were used to calculate the 2003/04 Cap target and the cumulative credits since 1997.

A model of the Wimmera-Mallee system has been developed as part of the recent Bulk Entitlement conversion process, and calibrated over the period 1993 to 1999. Provisions to model the various stages of the Northern Mallee Pipeline Project have also been included. Model input data has been updated to June 2004 and significant improvements to the model have been made over the past year to facilitate Cap accounting. Further work is still required to refine the seasonal allocation module in the model to align with the implementation of the Bulk Entitlement Order. Documentation of model assumptions and calibration results is being prepared.

As a result of model improvements made over the past year, Cap targets back to 1997/98 have changed slightly compared with figures reported in previous years' reports. These changes are not large (at most, 5% of the long-term Cap) but should be noted.

Victoria remains committed to the ongoing development and improvement of Cap models for calculating annual Cap targets.

4.2.2 2003/04 Diversions

Record low water availability in July 2003 resulting from the severe drought conditions in northern Victoria in the previous season characterised the 2003/04 season. There was no water available for irrigation in the opening water allocations except for the Murray system where a lowest ever allocation of 16% of Water Right was announced. The outlook for water availability faced by the irrigation community was highly uncertain. The Minister of Water qualified rights to water in a number of areas to enable supplies to continue until conditions improved.

As resources improved, seasonal allocations were progressively increased but by the end of the season still remained at low levels on all of the major systems. Notably the Murray system finished with a record low allocation of 100%, and the Loddon finished with a sub-water right allocation for the second year running. It was the sixth consecutive year of 'no sales' water availability on the Goulburn, Loddon and Campaspe systems and the first time there has been 'no sales' water on the Murray system.

During the winter and spring months, inflows to storages were mixed. Storages on the upper Murray, upper Goulburn, Ovens and Broken systems recorded above average inflows in some months during the winter and spring. The best inflows were confined to the Upper Murray, Mitta Mitta and Ovens rivers with above average inflows extending into the summer in some cases. During the winter and spring, the Bureau of Meteorology (BoM) issued flood warnings for a number of river systems. Flooding was generally of a minor nature although short periods of moderate flooding occurred on the Ovens River and its tributaries and on the River Murray upstream of Hume reservoir. In contrast, inflows to storages on the Campaspe and Loddon Systems were well below average in all months.

All of the major storages on the Goulburn, Campaspe, Loddon and Murray River systems failed to fill to capacity during the year. However, unlike the previous year, Waranga Basin, Nillahcootie and Laanecoorie storages did fill during the spring. The storages on the Loddon and Campaspe Systems were drawn down to record low levels at the end of the irrigation season and in some cases continued to fall in June.

Diversions from the Murray/Kiewa/Ovens, Goulburn/Broken/Loddon and Campaspe valleys were each below their Cap targets for 2003/04. While Cap targets are not yet available for the Wimmera-Mallee valley, significant water savings have been achieved through the Northern Mallee Pipeline Project and some of these savings have been allocated to the environment. Environmental releases consistent with this were made in 2003/04. Thus, diversions in the Wimmera-Mallee valley should be less than the Cap.

All four Victorian valleys have cumulative Cap credits up to 30 June 2004. A comparison of diversions with Cap targets for each year since 1997/98 is shown in **Table 2**. These values are preliminary, as trade data needs to be reconciled with other valleys and final accuracy checking is yet to be undertaken.

It should be noted that, due to model improvements, Cap targets (and therefore Cap credits) back to 1997/98 have changed slightly (5% at most) compared with figures reported in previous years' reports. The nature of a Cap credit or debit previously reported in any single

years caused changes in the nature of some of the cumulative Cap credits or debits reported in previous years.

Goulburn/Broken/Loddon

Resource availability

Although Eildon rainfall was average for 2003/04, the total inflow to Eildon reservoir was only 85% of average. August and September were the only months recording inflows to Eildon reservoir greater than average. Runoff from the catchment between Lake Eildon and Goulburn Weir was only 53% of the annual average. The total inflow to Eildon reservoir for the 92 months ending June 2004 has been the lowest on record.

After filling to 43% of capacity in November 2003, Lake Eildon was drawn down to 18% of by the end of the 2003/04 season. This was the third lowest drawdown on record, after years 2000 and 2003. Unregulated flows downstream of Goulburn Weir occurred only for a few days in spring.

The initial 2003/04 allocation on Goulburn System was 0%. However, this rose to 18% on 15 August 2003 and 100% of Water Right on 1 November 2003. This allocation remained for the remainder of the season and 'no sales' was available for the sixth year in a row.

Good inflows during the following winter-spring months resulted in the Waranga Basin being effectively full by early October 2003. By the end of the 2003/04 irrigation season, water levels were drawn down to 25% without the



Table 2: 2003/04 Diversions (preliminary values) compared with Schedule F Targets (GL/year)

<i>Valley</i>	<i>Long-term Cap</i>	<i>2003/04 Cap Target</i>	<i>Net Adjustment to Cap because of trade</i>	<i>Diversion</i>	<i>Cap Credits (Cap target less diversion)</i>		
					<i>2003/04</i>	<i>Cumulative since 1 July 1997</i>	<i>20% Schedule F Trigger</i>
Goulburn/Loddon/Broken	2058	1679	-35	1592	52	25	-412
Murray/Kiewa/Ovens	1665	1589	36	1486	139	588	-333
Campaspe	122	82	—	70	12	44	-24
Wimmera-Mallee	162	N/A	—	69	N/A	N/A	-33
Interim Mokoan allowance	22	22	—	—	22	154	—
Total	4029	—	—	3217	—	—	—

need for pumping (as was necessary at the end of the 2002/03 season).

Inflows to Lake Nillahcootie were 70% of the annual average and the storage filled by August 2003. Lake Mokoan was drawn down from 45% of capacity in late October 2003 to 22% by the end of the season. The carryover volume in Lake Mokoan at the end of the 2003/04 irrigation season was marginally more than for 2002/03. There were no serious problems with blue-green algae at Lake Mokoan and as a result, the storage remained available all season. A River Murray supplement was not made available from Lake Mokoan during the year.

The Broken system allocation opened at 0% but by the end of the season had increased to 100% with 70% sales.

A combination of very low carryover volumes and low inflow resulted in Cairn Curran and Tullaroop storages both reaching only 18% of capacity in late spring. However, unlike 2002, Laanecoorie reservoir did fill to capacity in the spring. Releases from these reservoirs had to be severely restricted to ensure these storages did not fail. By late May 2004, Cairn Curran and Tullaroop storages had been drawn down to record low levels of 4% and 10% of capacity respectively.

The opening Loddon allocation was 0% but increased to 67% of Licenced Volume by the end of the season. This was the first time ever that the linkage to the Goulburn System allocation has not been preserved.

Cap compliance

Diversion from the Goulburn/Broken/Loddon valley was 1,592 GL, which is 52 GL (3%) below the Cap target of 1,644 GL (with preliminary adjustment for trade). Diversions were 23% below the long-term Cap of 2,058 GL/year.

Due to model improvements, the carry-over Cap credit for this valley has been revised from 12 GL (the 2002/03 cumulative Cap credit reported last year) to -27GL (ie a 27 GL Cap debit). This results in a 2003/04 cumulative Cap credit for the Goulburn/Broken/Loddon valley of 25 GL since accounting commenced in July 1997.

The above calculations do not include the 22 GL/year interim allowance for the full utilisation of Lake Mokoan.

Murray/Kiewa/Ovens

Resource availability

Natural inflows to Dartmouth and Hume reservoirs were 98% and 80% of average for the year. Hume reservoir peaked at 73% in November 2003 whilst Dartmouth reservoir did not reach its peak of 48% of capacity until February 2004. By the end of the irrigation season, Lake Hume had been drawn down to 8% and Lake Dartmouth to 47%.

River Murray Water commenced transferring water from Dartmouth reservoir to Hume reservoir in August 2003 but thereafter suspended transfers until the summer months. Irrigation releases from Hume reservoir commenced in mid October 2003. Above-minimum releases were maintained from Hume reservoir during June 2004 as part of a planned filling strategy by River Murray Water for Lake Victoria. As a result of unregulated tributary inflows, surplus flows occurred at downstream of Yarrawonga Weir during July, August and September 2003.

Good inflows ensured that the Buffalo and William Hovell storages on the Ovens System filled to capacity. By June 2004, these storages had been drawn down to 30% and 20% of capacity respectively. Once resources surplus to in-valley requirements had been identified, extra releases from these storages were made to gain an additional tributary credit as well as providing environmental benefits within the Ovens System.

The Menindee Lakes reached a record low of 2% full in February 2004. No supplement to the River Murray was available during the year.

Carryover storage in Dartmouth enabled Murray allocations to be higher than in the other systems. The opening allocation on the Murray System was 16% and increased to 100% of Water Right on 1 September 2003. The allocation did not increase further and hence, the 2003/04 allocation was the lowest on record. It was the first season ever that 'sales' water was not available on the Murray System.

Cap compliance

Diversion from the Murray/Kiewa/Ovens valley was 1,486 GL, which is 139 GL (9%) below the Cap target of 1,625 GL (with preliminary adjustment for trade). The diversion was 11% below the long-term Cap of 1,665 GL/year.

Due to model improvements, the carry-over Cap credit for this valley has been revised from 412 GL (the 2002/03 cumulative Cap credit reported last year) to 449 GL. This results in a 2003/04 cumulative Cap credit for the Murray/Kiewa/Ovens valley of 588 GL since accounting commenced in July 1997.

Campaspe

Resource availability

Inflows to Lake Eppalock were 31% of the average annual and the storage reached only 22% of capacity in early October 2003. By the end of the irrigation season, the Lake had been drawn down to a record low of 5% of capacity. The Campaspe River was highly regulated for almost the entire year.

Due to the low water availability, water efficiency measures were implemented, such as diverting some Campaspe River flows into Green's Lake during the winter and spring months, using the Waranga Western Channel (WWC). This water was used later in the season to augment Campaspe River flows downstream of Rochester and meet the needs of Campaspe Irrigation District customers along the WWC.

The Campaspe System allocation remained at 0% until 1 September 2003, when it increased to 41% and eventually reached 100% by the start of May 2004. Although the final allocation reached the previous minimum value, conditions in the Campaspe were very difficult with the allocation remaining at less than 100% to almost the end of the irrigation season.

Cap compliance

Diversion from the Campaspe valley was 70 GL, which is 12 GL (14%) below the Cap target of 82 GL (no adjustment for trade is necessary). Diversions were 42% below the long-term Cap of 122 GL/year.

Due to model improvements, the carry-over Cap credit for this valley has been revised from 33 GL (the 2002/03 cumulative Cap credit reported last year) to 32 GL. This results in a 2003/04 cumulative Cap credit for the Campaspe valley of 44 GL since accounting commenced in July 1997.

Wimmera-Mallee

Resource availability

The 2003/04 season encompassed the most extreme period of water shortage in the history of the Wimmera-Mallee region. The year 2003 had the 20th lowest flow to headworks storages since records started in 1903. Seven consecutive years of well below average inflow meant that regional water availability remained unprecedented, continually setting new records for shortage.

At July 2003, the total storage volume was 7% of capacity, which is well short of the 11% needed to provide a minimal channel supply to towns and farms. The start of the damfill season was delayed in the hope of winter rains to enable a more normal channel supply. Fortunately minor rain in July to August 2003 lifted storage volumes to 10%. This limited the need for emergency water carting measures to only a few weeks and allowed for a highly restricted channel run to fill house dams only. Two further rainfall events increased storage volumes to 13%, allowing some extra dams to be filled on properties carrying significant stock numbers. The late start combined with very unusual weed growth in channels caused the completion of channel run to be delayed until February 2004.

Modest spring inflows increased storages to 15% of capacity by the start of summer. However, harsh restrictions were still necessary for the 2003/04 summer dam fill. The summer domestic and stock run was limited to filling one dam per enterprise, or about 18% of the total number of dams in the summer run area. There was no water for irrigation in summer, the second successive year of zero supply. A small volume was made available to some customers who risked the loss of trees or vines if a bare survival volume of water was not available. Otherwise, supply for irrigation customers was limited to house dam-fills as for other domestic and stock customers.

Supply to the environment was also severely restricted, although more was provided than in previous years. A total 8,215 ML was allocated as compensation and environmental flow releases for the Glenelg, Wimmera and upper Mackenzie Rivers. By April 2004 reservoirs hovered around 9%, which was enough to provide a highly restricted winter channel run to supply one dam for each 400 hectares.



Cap compliance

Diversion from the Wimmera-Mallee valley was 69 GL in 2003/04. An annual Cap target has not been calculated for this valley as, although a model has been built, it has not refined to align with the implementation of the Bulk Entitlement. The provisional model has been used to provide an interim estimate of the long-term Cap of 162 GL/year.

Diversions for 2003/2004 were 58% below the long-term Cap. Usage has remained within Cap as there have been significant water savings since 1993 through construction of the Northern Mallee Pipeline. A portion of these savings have been allocated to the environment. The environment's entitlement from savings was 34.7 GL/year at the end of the 2003/04 water year.

4.2.3 Administration of the Cap

Between 1995 and 1997 Victoria introduced and refined the following changes to water management in response to the Murray-Darling Basin Ministerial Council (MDBMC) decision to Cap water use;

- restrictions on temporary and permanent water trading,
- reductions in allocations for a given resource, and
- limits on the issuing of new entitlements.

Monitoring of the effectiveness of the water management policies is undertaken on an ongoing basis. No new capping policies were introduced in 2003/04 and none are proposed for 2004/05 as these measures have continued to be effective. There is no evidence of growth in diversions in any of the Victorian valleys.

Victoria remains committed to the Cap through the continued establishment and implementation of Bulk Entitlements and Streamflow Management Plans (SFMPs) and the licensing of irrigation farm dams.

Bulk Entitlements

Victoria continued to implement the Cap on regulated systems by establishing Bulk Entitlements in accordance with the *Water Act 1989*.

The current status of Bulk Entitlements in the Victorian portion of the Murray-Darling Basin is as follows:

Goulburn Basin – Bulk Entitlements were granted in 1995.

Murray (Victorian system) – Bulk Entitlements were granted in July 1999.

Campaspe Basin – Bulk Entitlements were granted in May 2000.

Kiewa River – Bulk Entitlements were granted in the Upper Kiewa in May 2000.

Broken Basin – awaiting Ministerial approval.

Ovens River – awaiting Ministerial approval.

Wimmera-Mallee – Bulk Entitlements were granted in May 2004.

Loddon Basin – progressing.

An additional environmental entitlement for the Snowy Environmental Reserve was granted in June 2004 as a result of the transfer of water savings from the Normanville Pipeline in the Goulburn System. Similar water savings projects will result in the creation of additional environmental entitlements next year.

Streamflow Management Plans

Interim capping arrangements were put in place in 1995 to constrain diversions (section 51 licenced diversions) on unregulated streams until SFMPs could be developed. The two key rules were:

- no new diversion licences, except through transfer of existing ones (this had largely been in place for some years, but was extended to winter-fill licences); and
- trade must be downstream and there is a 20% reduction in volume, unless the resulting licence is a winter-fill one.

The streamflow management planning process is very similar to the one used for conversion of Bulk Entitlements. SFMPs are an open, consultative, evidence based, water resource planning process. The objective of a SFMP is to manage the water resources of the relevant area in an equitable manner to ensure the long-term sustainability of the resource. A SFMP defines the total amount of water in an area and prescribes how it will be shared between water users and the environment. Note that Bulk Entitlement holders are stakeholders within the plan but are not legally obliged to comply with plan outcomes.

The plans affect the issuing of, and conditions set in licences, rostering rules in dry periods, metering and monitoring, and the transfer of licences. SFMPs will ensure section 51 licenced diversions do not increase above an agreed sustainable diversion limit. They consider what

extra development should be allowed into a valley given local conditions, but any new development has to be via transfer of existing rights so that flows in the River Murray are not ultimately affected.

The amendment to the *Water Act 1989*, introduced in 2002, has provided for increased certainty in the management of unregulated streams in Victoria. As part of the SFMP provisions, new procedural arrangements (eg tabling of SFMPs in Parliament) have been put into place and the scope of consultation in the development of these plans has increased. The transition to meeting this new legislative and consultative approach, and the need to retrofit existing plans, has meant that while commencement of the development of these plans is proceeding to schedule, finalisation may take longer than originally anticipated.

Additionally, the recently released White Paper 'Securing Our Water Future Together' has committed to improving the management, compliance and accountability for water use, and protecting and repairing river health in unregulated rivers.

As a result of the White Paper the development of SFMPs in northern Victoria has been reassessed. The development of following SFMPs is currently underway:

- Ovens River above Myrtleford;
- Kiewa River;
- Yea River;
- Seven Creeks;
- King Parrot Creek; and
- Upper Wimmera River.

A round of public consultation has been completed for four Plans (Ovens, Kiewa, Yea and King Parrot Creek). The White Paper now requires that these Plans be revised to meet Government commitments to improving the management, compliance and accountability for water use, and protecting and repairing river health before being submitted to the Minister. Plans for more high priority streams will be developed by Catchment Management Authorities under the Victorian River Health Strategy, which will also promote improved management in all unregulated systems.

4.2.4 Irrigation Farm Dams

Victoria not only manages water in waterways, but also licences the use of water for irrigation and commercial use in catchment dams under the *Water (Irrigation Farm Dams) Act 2002*. Existing dams used for irrigation or commercial purposes

were required to be either licenced or registered during the period 1 July 2002 to 30 June 2003. All new irrigation and commercial use of water must be licenced, whether the proposed dam is located on a waterway or not. The legislation has also led to the establishment of Permissible Annual Volumes for catchments across the state, establishment of exchange rates to ensure Cap is preserved when licences are traded, and has provided a legislative backing for locally developed SFMPs.

Approximately 8,000 applications to licence 17,000 existing catchment dams have been received. Water Authorities are continuing to assess these applications and issue necessary licences. Any new licence application for catchment dams are subject to the MDBC Cap and new developers are required to purchase an existing entitlement.

4.2.5 Off-Quota Policy

In mid 2003 the policy of announcing off-quota allocations when unregulated flows occur downstream of storages was discontinued and replaced on an interim basis with a new 'advance arrangement' which only allows access to unregulated flow in years of severe water shortage. This new arrangement applies until 31 December 2004 and would then be subject to review.

Under this arrangement advances will be announced when allocations are less than water right but these must be paid back when the allocation reaches 100% of water right. It will also be available when the sales allocation is less than 30% but must be paid back when the allocation reaches this level. It is also a requirement that the period when the advance is available on the River Murray must provide equal access to all Victorian Murray users.

This will result in a significant reduction in usage during periods of "declared surplus" in the future.



4.2.6 *Proposals to Refine Implementation in 2004/05*

Proposed refinements to the management of the Cap in 2004/05 include:

- Model for the Goulburn/Broken/Loddon and Campaspe valleys expected to gain Commission approval by July 2005;
- Model for the Wimmera-Mallee valley expected to gain Commission approval by July 2005;
- Re-calibration and auditing of the Murray model expected to be completed by October 2005, in time for use in producing 2004/05 Cap targets;
- Bulk Entitlement process for Broken expected to be completed November 2004;
- Bulk Entitlement process for Ovens expected to be completed November 2004; and
- Bulk Entitlement process for Loddon expected to be completed June 2005.

In June 2004, the Victorian Government released a White Paper 'Securing Our Water Future Together', which outlines a comprehensive, integrated approach to managing Victoria's water resources over the next 50 years. The initiatives in the White Paper reinforce the Victoria's commitment to working with the MDBMC and the other Basin states to implement the MDB Cap and the *Living Murray initiative*.

Adjustments to the Cap will be required to account for water saved through water savings projects and the delivery of environmental water as part of White Paper initiatives, which include:

- decommissioning Lake Mokoan; and
- the conversion of 'sales' water into a separate, legally recognised, independently tradeable entitlement and the allocation of 20% of this new entitlement to the environment.

Cap adjustments will be made through changes to the Cap models or by adjusting the modelled Cap targets where appropriate.

Collaboration with Grampians Wimmera-Mallee Water will be required in order to align reported diversion with the definition of the Cap for the Wimmera-Mallee valley as defined in the Bulk Entitlement. Grampians Wimmera-Mallee Water is currently developing a database for the management of its operational data. This will assist in the process of reporting recorded diversions in a consistent manner from year to year. It is anticipated that this database will be used for reporting 2004/05 diversions. Further

discussions with Grampians Wimmera-Mallee Water are also required to determine how the Cap will be adjusted to account for water savings projects, such as pipelining.

4.2.7 *IAG Assessment*

Diversions for the Murray/Kiewa/Ovens Valley, Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee were all below annual climate and trade-adjusted Cap targets.

All valleys have accumulated credits. Significant progress has continued on developing, improving and accrediting the models used to predict climate-adjusted diversion Caps. A preliminary review of the Goulburn/Broken/Loddon and Campaspe models has necessitated further improvements and revised documentation is expected to be submitted to the auditor for model accreditation by July 2005. The Murray component of the Murray/Kiewa/Ovens model is being recalibrated.

A model of the Wimmera-Mallee system has been developed and following documentation of model assumptions and calibration results is expected to be submitted for audit and accreditation by July 2005.

The establishment of Bulk Entitlements is continuing with the process for the Broken and Ovens expected to be completed in November 2004 and the Loddon in June 2005.

Work also continues on the preparation of Stream Flow Management Plans for unregulated rivers to provide certainty for irrigators while continuing to improve river health.

Victoria continues to further develop a strong legal and policy framework and supporting processes to manage the Cap and the requirements of Schedule F.



4.2.8 Conclusions/Recommendations

- Diversions for the Murray/Kiewa/Ovens Valley, Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee are all below annual climate and trade-adjusted Cap targets.
- Cumulative diversions for all valleys are in credit.
- Accreditation of the Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee models is expected by July 2005.
- Bulk water entitlements for Broken, Ovens and Loddon will be finalised by July 2005.
- Significant progress has been made in the preparation of Stream Flow Management Plans for unregulated rivers. Diversion from these rivers is minor compared to regulated sources.



4.3 New South Wales

4.3.1 The Cap

Assessment of Cap performance has been conducted on a valley-by-valley basis according to the requirements of Schedule F to the Murray-Darling Basin *Agreement*. Until the current year, cumulative performance since 1997/98 relative to the Cap has been assessed for those valleys in the south of the State based on a water-year that runs from July to June. For those valleys in the north of the State, the water-year ran from October – September. However, from 2003/04, the water-year in the north of the State also runs on a July – June year following the implementation of the Water Sharing Plans introduced by the NSW Government. Thus all valleys in NSW now report on a July-June year.

The Department of Infrastructure, Planning and Natural Resources (DIPNR) has developed a suite of Integrated Quantity/Quality Models (IQQMs) for each of its major regulated valleys and the Barwon-Darling. The IQQM for the Lachlan has been approved for use under Schedule F, the IQQM for the Macquarie is to be presented to the Commission for audit following recalibration, and the IQQM for the Namoi is currently undergoing audit prior to Commission approval. Interim and final IQQMs are also available for Cap auditing in the Murrumbidgee, Gwydir, Border Rivers and Barwon-Darling Valleys. (Table 3).

For the Murray and Lower Darling, the MDBC's Monthly Simulation Model (MSM) is used for Cap auditing. For the 2003/04 year, pending completion of the IQQM model for the Peel valley, an informal assessment of the level of annual water extraction has been made using a climate-diversion relationship.

It has become evident over the last 12 months that some of the models that have or are being prepared, including the IQQM model for the Lachlan, will require recalibration. This has been as a result of the severity of the current drought and the need to reconfigure the models to reflect the outcomes currently evident from the limited availability of water. As a consequence, the reliability of the existing IQQM models has been questioned, and the IAG has had to rely upon interim estimates in forming a view as to whether the Cap triggers have been exceeded during the 2003/04 year.

4.3.2 2003/04 Usage

The IQQM models in interim form have primarily been used to determine whether individual valley diversions have exceeded the Cap. The difference between the annual diversion target or climate-adjusted Cap and the actual recorded diversion for each valley is recorded as either a credit or a debit for the year. This is then added to the previous year's debit or credit, which is then compared with the Schedule F exceedance trigger. This exceedance trigger is 20% of the long-term average diversion generated from the analytical model.

Table 3: NSW Cap Auditing Models Status 2003/04

<i>Valley</i>	<i>Auditing Tool</i>	<i>Comment</i>
Murray/Lower Darling	Murray Monthly Simulation Model (Interim)	Undergoing recalibration with some indication of a small over-estimation of credits
Murrumbidgee	IQQM (Interim)	Preliminary results available but model recalibration required
Lachlan	IQQM (Final)	Approved for use under Schedule F but requiring recalibration
Macquarie	IQQM (Final)	To be represented for omission approval following recalibration
Peel	Awaiting IQQM	Under development
Namoi	IQQM (Interim)	Undergoing audit for Commission approval
Gwydir	IQQM (Interim)	Undergoing recalibration
Border Rivers	IQQM (Interim)	Definition of Cap not complete
Barwon-Darling	IQQM (Final)	Preliminary results available

Table 4 provides a summary of NSW diversions by river valleys. This table identifies those valleys where diversions are in credit or in debit against annual Cap values and whether or not those in debit have exceeded the Schedule F trigger.

Border Rivers

The Border Rivers IQQM model is in development, with only draft 1993/94 Cap and 'current' scenarios having been produced. Currently there is a consultative process in progress between NSW and Queensland regarding the IQQM modelling, and setting of Cap levels. Currently there is no agreed Cap level, and consequently no estimates of Cap are available. The NSW Border Rivers is managed using a water-year that runs from 1 October

to 30 September. However, Cap reporting is presented in this report using a July-June water-year, for consistency with other NSW valleys.

As was the case in 2002/03, storage levels in Menindee Lakes were at a critically low level for on-going supply to Broken Hill at the commencement of the 2003/04 water-year. Forecasts indicated that supply to Broken Hill could not be guaranteed for the next 18 months, should dry conditions continue. It was estimated that an improvement of around 300 – 350 GL in Menindee Lakes storages would be required to secure on-going town water supplies and other high security requirements.

Under these circumstances supplementary access (previously known as off-allocation access) to surplus flows produced by rainfall and tributary inflows in the Border Rivers in October and

Table 4: NSW Valley Diversions 2003/04 (GL)

<i>Designated River Valley</i>	<i>Long-term Diversion Cap</i>	<i>2003/04 Cap Target</i>	<i>Net Trade in to Valley</i>	<i>Cap credits (Cap target less diversion)</i>				
				<i>2003/04 diversion</i>	<i>2003/04</i>	<i>Cumulative since 1 July 1997</i>	<i>20% Schedule F Trigger</i>	<i>Trigger Exceeded</i>
Barwon-Darling	173	154	0	269	-114	-299	-35	Yes
Lower Darling	137	38	0	23	15	175	-27	No
Combined Barwon-Darling and Lower Darling	310	192	0	292	-100	-124	-62	Yes
Border Rivers	n/a	n/a	-3	114	n/a	n/a	n/a	n/a
Gwydir	344	n/a	0	170	n/a	-29	-69	n/a
Namoi/Peel	338	189	0	173	16	-12	-68	No
Macquarie/Castlereagh/Bogan	468	254	0	210	44	-64	-94	No
Lachlan	334	91	0	59	32	-10	-67	No
Murrumbidgee	2302	1933	-35	1776	122	470	-460	No
NSW Murray	1924	1533	38	1311	260	301	-385	No
TOTAL	6020	4192	0	4105	374	532	-1205	—

Note:

- All volumes are shown in Gigalitres (GL); n/a indicates estimate is not available.
- A positive difference indicates a Cap credit, and a negative difference indicates a Cap debit.
- Long-term Diversion Caps do not include floodplain harvesting components to maintain consistency with observed diversions.
- Table 4 includes estimates of unregulated diversions for the valleys concerned.
- Cumulative Cap credit for Gwydir is until 2002/03



December 2003, was withheld - both from the NSW parts of the Border Rivers system and Barwon-Darling users. In January 2004, however, widespread rainfall in Queensland and northern NSW produced significant flow events in the Border Rivers and the Weir River from Queensland. There was sufficient volume of flows to lift embargoes on off-allocation access.

In 2003/04, State Water surveys estimate that only 12,700 ha of crops were irrigated in the regulated NSW Border Rivers system (27,000 ha in 2002/03), with approximately 10,800 ha (85% of the total area) being cotton (26,500 ha in 2002/03).

The Murray-Darling Ministerial Council has accepted that an allowance be made for the enlarged Pindari Dam, which was completed in 1994, and for it to be included within the NSW Border Rivers Cap. The levels of irrigation development commensurate with the Pindari Dam enlargement have yet to be established. Consequently, it remains unclear whether or not the current development is simply a take up of the allowance for Pindari enlargement as foreshadowed by the Ministerial Council or growth beyond that allowance. This will be determined when the Cap proposal is put to the IAG for consideration, and no Cap target updates are available as yet.

An assessment of on-farm storage capacity in the NSW Border Rivers in 2003/04 indicates a total of 159 GL. However, with the severity of the drought, no water is believed to be held in these storages as at October 2004.

As with development levels an assessment has yet to be made as to whether or not the recent on-farm storage increase would be acceptable under the post-Pindari allowance.

There were no changes to the management rules for 2003/04 from those in place during 2002/03.

Environmental flow rules have not yet been determined for the Border Rivers. As the Border Rivers are managed under an interstate agreement, per the *New South Wales Queensland Border Rivers Act 1947 (NSW)* and the *New South Wales-Queensland Border Rivers Act 1946 (Queensland)*, neither state is able to make unilateral changes to flows without agreement by both of the participating States. Environmental flow rules for Border Rivers are planned to be implemented via the joint development of a Flow Management Plan by NSW and Queensland.

Negotiations are continuing with Queensland, aimed at producing an inter-governmental

agreement on common principles for flow and diversion management. This will then form the basis for setting of environmental flows.

NSW has expressed its commitment to establishing environmental flows for the Border Rivers, but notes that any changes in flow arrangements must be within the limit of 10% impact on long-term diversions under 1993/94 levels of development (the Cap) to maintain an approach consistent with other NSW river valleys.

To date, discussions between NSW and Queensland on a model for the combined NSW and Queensland diversions have been based on preserving a target of around 61% of the natural flow at Mungindi. This is the volume of flow expected at Mungindi under the November 1999 moratorium conditions. However, concerns over the model's ability to define each State's share of the total combined diversion have resulted in a reconsideration of sharing between the States, and specification of the volume of flow at Mungindi to be preserved. Consequently at this stage the arrangement for sharing of flows between the States remains unfinalised.

The major changes to the management rules since the commencement of Cap accounting in 1997/98 remain the introduction of continuous accounting in 2001.

The Border Rivers IQQM has been configured to produce a draft 1993/94 and a 1998/99 conditions scenario for comparison of long-term impacts. However, no agreed Cap scenario is currently available.

Until definition of the Cap for the Border Rivers is agreed, it is not possible to give a final opinion on performance at this time. The IAG has previously expressed concern that, once a Cap is agreed it will become evident that diversions in the Border Rivers exceed that Cap. The IAG also notes that a Cap on the Border Rivers for NSW should indicate an appropriate allowance for Pindari Dam.

While NSW and Queensland appear to believe that they can negotiate a sharing arrangement by mid 2005, the IAG notes that the development of the rules for use on both sides of the border could further delay the overall effective implementation of this negotiated outcome. Thus effective implementation of the Cap in this valley appears to be some years away.

Allowing for 14 GL of unregulated stream diversion, total diversions in the NSW Border Rivers was 114 GL.



Gwydir Valley

The Cap for the regulated sections of the Gwydir Valley is currently assessed using the Gwydir IQQM. The Gwydir IQQM simulation of Cap is preliminary, and is currently being recalibrated to assess the impact of more recent estimates of a significant increase in on-farm storage beyond that previously estimated.

Currently, the water-year for the Gwydir valley runs from October to September. For Cap reporting, a July - June water-year has been used. Implementation of the Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004, and is now currently in operation. Consequently, the Gwydir valley will now operate using a July - June water-year for 2004/05. Allowing for 10 GL unregulated stream diversion in 2003/04, total diversions in the Gwydir Valley for the year were 170 GL.

No estimate of irrigated crop areas is currently available for 2003/04. Industry estimates report irrigated cotton crop areas at about half of 2002/03 estimates at around 21,000 ha.

An assessment of on-farm storage capacity in the Gwydir Valley in 2001/02 indicated a total of 430 GL. This represents a large increase of 80 GL (23%) from the previously reported total in 1999/00. As yet, State Water has not prepared an assessment for 2003/04. However, following representations from the industry concerning the extent of existing storage facilities, DIPNR has undertaken an extensive verification of on-farm storage capacity over the last 12 months. This involved the voluntary release by individual irrigators of construction survey information, mostly held by private survey consultants. The results of this process indicate on-farm storage as at 2003/04 of 524 GL an increase of 22% on the estimate provided in 2001/02 although this estimate may have been an under-recording of actual on-farm storage at that time.

For the 2003/04 season, no significant changes were made to management rules from those that applied in 2001/02.

The major changes to the management rules since the commencement of Cap accounting in 1997/98 remain the introduction of the environmental flow rules and continuous accounting, both in 1998.

During 2002/03, the IAG was asked to adjudicate on the development levels associated with Cap. In accordance with the

recommendation of the IAG, DIPNR agreed to reconfigure the Gwydir valley IQQM based on the data provided by Agrecon and to base the maximum irrigated area for the Cap scenario at 80,000 ha. However, there remained some doubt about the estimates of on-farm storage capacity produced by Agrecon, and DIPNR has now undertaken detailed ground-truthing activities to establish more closely the current on-farm storage capacity. The results of this work are referred to above.

DIPNR is modelling for the Schedule F accounting period using a version of the Gwydir valley IQQM that incorporates the ground-truthed on-farm storage data, and a maximum irrigated area reflecting the IAG determination. However, this revised version of the IQQM will not be available for accreditation until at least July 2005. As a consequence the Cap target for 2003/04 was not available.

As the Gwydir IQQM has not yet been recalibrated using this revised data, the long-term simulation results prepared by DIPNR are from the currently endorsed Gwydir IQQM using previous Department of Land and Water Conservation (DLWC) datasets to produce a 1993/94 scenario, a current conditions scenario (based on 1999/00 development) and a Water Sharing Plan scenario for comparison of long-term impacts. All of these scenarios simulate 108 years, and the resultant diversions from the river are compared to ensure Cap compliance in the long-term.

The Water Sharing Plan (WSP) for the Gwydir Valley includes changes to the current environmental flow rules as well as other management rules. The significant changes from the current management rules are:

- Increase in the Environmental Contingency Allowance (ECA) from 25 GL of general security with a 150% account limit, to 45 GL of general security entitlement with a 200% account limit; and
- The annual water use limit has been changed from 100% to 125%, subject to a 300% use limit in any 3 year period.

The long-term modelling prior to re-calibration indicated that diversions under current conditions will be below Cap by 5%, and that diversions under the Water Sharing Plan will be below Cap by 7%.

Until the IQQM model has been recalibrated and clarified, the IAG is not in a position to draw a final conclusion on the status of the Cap for the Gwydir. The IAG has previously expressed



concern about the extent of growth in on-farm storage in the valley and notes that the ground-truthing studies have now confirmed the much greater extent of this storage.

The IAG is pleased to note the progress that has been made in addressing the fundamental data problems identified previously. In addition, the IAG notes the results from the projection modelling undertaken by DIPNR to provide assurances regarding the probability of the Cap trigger being exceeded in the longer term. However, until the new data can be incorporated into the IQQM model and this verified, the IAG is not able to say with certainty that the Cap has not been exceeded or is in danger of being exceeded once the drought finally breaks.

Namoi/Peel Valley

There are two regulated systems within the Namoi Valley: the Peel River system, which is supplied from Chaffey Dam, and the Manilla/Namoi system, which is supplied from Split Rock and Keepit dams. The Namoi valley is currently managed to an October - September water-year, and the Peel is managed to a July - June water-year. For Cap reporting purposes, a July - June water-year has been used for both valleys.

Whilst the two systems fall into one river valley under definitions given in Schedule F, supporting information is reported separately, as they have different management rules and irrigation behaviour.

The Cap for the regulated sections of the Namoi Valley is currently assessed using the Namoi IQQM. The Namoi IQQM simulation of Cap is currently preliminary, and has been presented for independent audit and approval for use under Schedule F. The Peel IQQM is not yet available for Cap auditing, and a preliminary climate-diversion relationship has been used as an indicator. The Namoi IQQM Cap scenario presented for audit includes some minor improvements over the version used for calculating Cap targets in 2003.

Implementation of the Namoi Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004, and is now currently in operation. Consequently, the Namoi valley will now operate using a July - June water-year for 2004/05. A Water Sharing Plan for the Peel Valley is yet to be developed.

After allowing 78 GL for unregulated stream diversions, diversions from the Namoi/Peel valley in 2003/04 were 173 GL.

For the Namoi/Manilla system, industry estimates of irrigated cotton crop area are 20,000 ha, about half of the 2002/03 crop. Between 25% and 75% of the reported irrigated cotton area in the Namoi Valley is partly or wholly irrigated using groundwater, particularly during periods of restricted surface water supply.

The estimated area irrigated in the Peel system in 2003/04 was around 2,040 ha. This is below the 2,781 ha observed in 2002/03 and 2,555 ha in 2001/02, and well below the peak of 3,762 ha in 1994/95.

A survey of on-farm storage capacity in the Namoi Valley by State Water in 2003/04 indicated that the valley storage total was approximately 204 GL, which represents a marginal increase over that found in the corresponding survey for 2002/2003. There is no significant on-farm storage in the Peel valley.

There have been significant increases in storage capacity since 1993/94 and, depending on how they are used, additional water could be taken by these larger storages and pose a risk to Cap. However, the installed pump capacity has not increased significantly since 1993/94.

For both systems, there have been no significant changes to the management rules that applied in the 2002/03 water year. The major changes to the management rules since the commencement of Cap accounting in 1997/98 remain the introduction of the environmental flow rules and continuous accounting in the Namoi valley, both in 1998.

The Namoi/Manilla IQQM has simulated both the 1993/94 and current conditions scenarios. Both runs use 107 years of data. The simulated diversions from the river are compared to test for Cap compliance in the long-term.

Long-term simulations indicate that, had development and water access rules been as they currently are for the last 107 years, the average annual diversions would be 2% below the average annual Cap diversions.

Notwithstanding these findings the cumulative Cap accounting that would be expected over the full period of simulation indicates that there are some years where the Cap would indeed be exceeded. DIPNR has argued that while their modelling suggests that a breach of the trigger would not be unusual, the management rules being applied in this valley would ensure long-term Cap compliance.

An IQQM for the Peel valley is currently being developed. In the absence of this model, conclusions about how well the current management rules will hold Cap are not possible.



DIPNR has also undertaken a review of whether the 1999/00 development levels configured into the Namoi IQQM continue to represent current conditions. The analysis undertaken suggests that the 1999/00 conditions scenario remains representative of current behaviour and development in the valley.

Diversions in 2003/04 were below the annual Cap target by 16 GL. The combined Namoi/Peel valley has a cumulative Cap debit since 1997/98 of 12 GL, which is below the trigger of 68 GL for special auditing. For Cap purposes, results are considered preliminary at present until the model is independently audited under the provisions of Schedule F of the Murray-Darling Basin Agreement.

The MDBC had declared the Namoi valley in breach of Cap following 2000/01 Cap audit. However, following recalibration of the Namoi IQQM, the MDBC in 2001/02 found that the combined Namoi/Peel system was no longer in breach of Cap. The Namoi/Peel remains below the trigger for special auditing following the 2003/04 water year. Once the Peel IQQM is completed it should be possible to review the performance of the Namoi/Peel Valley. The IAG notes DIPNR's assessment that the Cap trigger may be breached more regularly than in other valleys, but that in the long term the current management rules will ensure the Cap is met.

Macquarie Valley

The performance of the Macquarie Valley relative to the Cap is being monitored using the IQQM model for the valley. The Macquarie IQQM simulation of Cap is currently preliminary, and is undergoing an independent audit and approval for use under Schedule F. Difficulties in reproducing observed inflows to Burrendong Dam within the model during the Schedule F accounting period became apparent in 2002/03, and no Cap target updates were available at the 2002/03 Cap audit in October 2003. No further data was available at that time of Supplementary Audit held in February 2004. Some of the issues identified have now been addressed and NSW has provided the Cap target for the current year as well as the previous year.

Implementation of the previously announced Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004, and is now currently in operation.

State Water surveys indicate that around 25,900 ha of crop was irrigated from the regulated

Macquarie system during 2003/04 (53,900 ha 2002/03), with the cotton area estimated at around 15,400 ha (29,200 ha in 2002/03).

There have been no recent formal surveys of on-farm storage development in the Macquarie Valley. The on-farm storage capacity in the Macquarie Valley is thought to be around 110 GL.

An Annual Allocation Plan (AAP) was produced for the 2003/04 season, outlining the management rules that would apply.

In response to the severe drought conditions, the assessment of water available for allocation was changed for 2003/04 only. Current policy when assessing the volume of water that may be allocated is to assume that the lowest historically recorded inflows that will occur either from the time of the assessment or at the end of the current inflows. For the Macquarie valley, inflows to Burrendong dam are assessed over a 2 year period. For 2003/04 only, the second year inflows were not assumed to be the lowest ever recorded for a 2 year period, but those equivalent to the 98th percentile were assumed. This (small) additional risk allowed an additional 60 GL to be made available, which is equivalent to an additional 8% of general security allocation.

The Macquarie IQQM upstream of Burrendong Dam has been recalibrated during 2003/04 to incorporate the revised, not previously observed, hydrographic flow data, and transmission loss behaviour during the recent very dry conditions. This has resulted in changes to the previously reported modelled Cap targets, the long-term average Cap diversion, and the cumulative Cap credit.

There have also been significant differences in river operation efficiency observed over the last few drought years. The Macquarie IQQM Cap scenario, being calibrated during wetter climatic conditions, does not reproduce this behaviour, which is leading to smaller Cap targets. Simulation of the full range of observed river operation, and its applicability to Cap conditions is currently being reviewed. NSW expects that within 12 months the revised IQQM can be available for independent auditing.

The Macquarie IQQM has been configured to produce a 1993/94 and a current conditions (1999/00) scenario for comparison of long-term impacts. At the time of 2002/03 audit Cap target was not available for that year. The Cap target for 2002/03 now made available shows that the valley would have exceeded the 20% Cap debit trigger for Special Audit last year. For 2003/04



the model has produced a Cap target of 254 GL while diversions over the year have been recorded as 210 GL. This is suggesting that the Macquarie is within the Cap and based on the available data, the Cap trigger has not been exceeded.

The long-term modelling undertaken by DIPNR indicates that diversions under current conditions would be below Cap by 10%.

Until further information is available and the revised modelling completed, the IAG cannot confirm the current status of the Macquarie Valley in terms of the Cap. However, the indications are that the Cap has not been exceeded in the most recent water year.

Barwon-Darling/Lower Darling

Following a Special Audit in February 2000, it was determined that the Barwon-Darling valley had exceeded Cap in 1998/99, and the valley was formally declared in breach of the Cap. At the August 2000 Ministerial Council meeting, agreement was obtained to report the Barwon-Darling and Lower Darling valleys as one, although the two would be managed separately by NSW.

The Barwon-Darling valley receives only unregulated flows from other valleys, and extraction for irrigation is not closely related to local climatic conditions, but rather the access to flows. Licenced pumpers receive no official allocation, and all supply is essentially opportunistic. The Cap for the Barwon-Darling Valley is currently assessed using the Barwon-Darling IQQM. The Barwon-Darling IQQM simulation of Cap is currently preliminary, and is awaiting independent audit and approval for use under Schedule F.

The Lower Darling is a regulated system supplied from Menindee Lakes. The system extends from the upstream limit of the Menindee to the upstream limit of the Wentworth Weir pool influence. At present, auditing is carried out using the Murray-Darling Basin Commission's Murray Simulation Model (MSM). The MSM estimates are considered preliminary, as a recalibration of the MSM is in progress by the Murray-Darling Basin Commission to better define 1993/94 irrigation development, management rules and behaviour.

Implementation of the Lower Darling Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004, and is now currently in operation.

As was the case in 2002/03, storage levels in Menindee Lakes were at a critically low level for on-going supply to Broken Hill at the commencement of the 2003/04 water year. Forecasts indicated that supply to Broken Hill could not be guaranteed for the next 18 months, should dry conditions continue. It was estimated that an improvement of around 300 – 350 GL in Menindee Lakes storages would be required to secure on-going town water supplies and other high security requirements.

Under these circumstances, supplementary access (previously known as off-allocation access) to surplus flows produced by rainfall and tributary inflows in the Border Rivers in October and December 2003 was withheld from the NSW parts of the Border Rivers system. The resulting inflows to the Barwon-Darling were protected to the extent that B and C Class pumping was completely embargoed and only limited volumes were extracted under exemptions for survival watering of permanent plantings. The October 2003 event produced around 24 GL of flows into the Barwon-Darling, but high losses resulted in flows reaching only partway down the system. The December 2003 event produced around 32 GL of flows into the Barwon-Darling, of which around 12 GL reached Menindee Lakes.

In January 2004, widespread rainfall in Queensland and northern NSW produced significant inflows to the Barwon-Darling system from the Namoi, Gwydir, Border Rivers, and intersecting streams from Queensland. To allow this water to reach Menindee and improve the supply outlook for Broken Hill, an embargo was placed on all B and C Class extractions from the Barwon-Darling from 30 December 2003. Once it became clear that sufficient water would reach Menindee to satisfy on-going high security requirements, access was subsequently permitted in stages to all categories of users in the Barwon-Darling. This resulted in an improvement of around 300 GL in storage volumes at Menindee Lakes, with some small subsequent improvements following this.

Generally the majority of resources in Menindee Lakes are for the Murray River, and the (approximately) 50 GL of entitlements for the Lower Darling have had full allocations every year until 2003/04. Drought conditions over the previous two years resulted in operation of Menindee Lakes solely for NSW Lower Darling requirements. At the commencement of 2003/04, no general security allocations were able to be made, and only very restricted volumes of water were available for high

security users to keep permanent plantings alive. Allocations were improved following improvements in storage levels in Menindee Lakes in February and March 2004, with high security receiving 100% allocations and general security receiving 30% allocations.

State Water collates survey estimates of developed and irrigated areas each year for the Barwon-Darling valley. The estimates for 2003/04 suggest a slight decline in the developed area for cropping and a negligible area irrigated in the year (100 ha). This reflects the impact of the drought and the embargo on pumping during the year. There was no change in on-farm storage capacity.

For the Lower Darling no cropped area estimates are available. Nearly all on-farm storage capacity in the Lower Darling valley is located on the Tandou property, and comprises 160 GL in natural lakes.

In 2003/04, there was no significant change to the management rules from the 2002/03 water year for the Barwon-Darling.

Following the breach of the Cap in 2000/01, in July 2002 NSW announced plans to reduce volumetric quotas by 5% for 2002/03 water year, and a further 15% for 2003/04 and 10% in 2004/05, subject to further socio-economic reviews. However, due to the unprecedented drought conditions throughout NSW, and the results of a socio-economic report on the planned quota reductions by the consultants Hassall & Associates, NSW has delayed these management actions.

An embargo on development was introduced in January 2001 as an interim measure to prevent growth in diversions until a long-term Cap management strategy was implemented. This continues in place for the Barwon-Darling system.

Due to record low inflows, a drought management plan was put in place in the Lower Darling at the commencement of 2003/04, and continued until inflows to Menindee commenced in February 2004. The plan involved rationing of water based on immediate water requirements between high security water users, with high security irrigators receiving only sufficient access to allow permanent plantings to survive. By early January 2004, the suspension of flows in the Lower Darling was required and, for the first time in over 50 years, the Lower Darling ceased to flow. Due to the period of no flows, and the preceding period of extended low flows, water quality issues became apparent in the Lower Darling. Consequently, part of the February 2004 inflows to Menindee storages

was used to provide a one-off flushing flow to improve water quality. A volume of 58 GL was released in late February and early March 2004, peaking at around 6,500 ML/day to dilute saline pools and re-establish supply to users.

As the Lower Darling River is managed under an interstate agreement (*the Murray-Darling Basin Agreement*) no individual State is able to make unilateral long-term changes to flows without agreement by either of the participating states. NSW, together with other States within the Murray-Darling Basin, are considering environmental flow options being developed as part of the *Living Murray* process.

Notwithstanding the moratorium placed on new infrastructure development since January 2001, extensive infrastructure development and increases in estimated irrigated areas since 1993/94 indicates that users in the Barwon-Darling River system are continuing to exceed the long-term Cap.

Due to extreme drought conditions over the past few years, some aspects of the IQQM modelling are currently under review, particularly the simulation of tributary inflows and the effects of this on simulation of floodplain harvesting. This review is unlikely to significantly alter the Cap performance of the Barwon-Darling since 1997/98, but may alter the assessment of Cap performance in the Lower Darling through better simulation of 1993/94 inflows to Menindee Lakes and the Lower Darling valley.

The preliminary Schedule F accounting for the 1997/98 – 2003/04 period indicates that the Barwon-Darling Valley is cumulatively 299 GL above Cap, and well above the 35 GL trigger for Cap exceedance based on 20% the estimated long-term average Cap diversion.

The Lower-Darling parts of the Monthly Simulation Model are currently undergoing re-calibration by the MDBC. This process is expected to be completed during 2004/05. Simulation of management of Menindee Lakes and replenishment flows into the Great Darling Anabranch within MSM are still under review.

Modelling of the Lower Darling is currently performed using observed inflows to Menindee Lakes. Given the above-Cap diversions occurring in the Barwon-Darling, these observed Menindee inflows are likely to be lower than those that should have occurred under 1993/94 conditions. Thus, the Cap targets for the Lower Darling may well be an under-estimate.

The preliminary Schedule F accounting for the 1997/98 – 2003/04 period indicates that



diversions in the combined Barwon-Darling and Lower Darling Valleys are cumulatively 124 GL above Cap, and above the combined trigger of 62 GL for Special Audit.

The administrative rules for the Barwon-Darling previously announced by the NSW Government have not been implemented to date and, and thus raises concern about the longer-term performance of the combined valley in terms of the Cap.

Lachlan Valley

The Cap for the regulated sections of the Lachlan Valley is currently audited on an annual basis using the results of the Lachlan Valley IQQM. The Lachlan Valley IQQM has been approved by the Murray-Darling Basin Commission under Schedule F.

Implementation of the Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004, and is now currently in operation.

Diversions were below the annual Cap target by 32 GL in 2003/04. This outcome, combined with some changes to the previous annual Cap targets resulting from updated climate data, produces a cumulative Cap debit since 1997/98 of 10 GL. This is less than the trigger of 67 GL and does not require a Special Audit.

Estimates of the irrigated areas for 2003/04 are not yet available. There has also been no significant on-farm storage development in the Lachlan Valley in the last year.

In September 2003, inflows to the Lachlan valley entered into a period in which they were lower than any previously observed.

In response to the extreme drought conditions, and the record low levels of water availability, a drought contingency plan was put in place which:

- continued the suspension of the rules relating to the “translucent” releases (a proportion of inflows to Wyangala dam);
- reduced end-of-system flow requirements for improved river operation; and
- allowed for differential sharing arrangements between high security water users on the basis of water requirements.

As a result of the continuing record low inflows into Wyangala storage, no translucent releases have been made since 2001/02.

Up to the commencement of the Water Sharing Plan on 1 July 2004, an account has been kept of releases foregone due to the suspension of the

translucent releases. The volume of water in this account must be set aside from inflows when the storage reaches 75% of capacity.

During preparation of 2003/04 Cap modelling, a number of revisions to climate data in previous years were identified. These changes arise from the revision of operational estimates of rainfall and evaporation and from the adoption of revised estimates of rainfall using NRM Enhanced Meteorological Data sets accessed via the SILO (Seasonal Information for Land Owners) website and result in changes to annual Cap targets for some of the previous water-years. The climate data changes result in an increase of 37 GL to total Cap targets from 1997/98 to 2002/03. This change has not changed the outcome of this year’s Cap audit. The valley’s cumulative debit remains below the 20% trigger of 67 GL irrespective of these changes.

The Lachlan valley was declared in breach of Cap by the Commission following the 2001/02 review of Cap performance. NSW announced revised Water Sharing Plans at that time. These management rules target long-term outcomes in addition to annual outcomes. The NSW Water Reforms process has consequently been based on long-term modelling of these management rules.

The Water Sharing Plan (WSP) developed for the Lachlan Valley includes changes to the current environmental flow rules as well as other management rules. Modelling of these rules by DIPNR indicate some years when the Cap might be exceeded but in general the modelling suggests that the valley will stay within the Cap over the longer term.

To address those instances where the Cap might be exceeded, amended management rules have been prepared. The significant changes from the current management rules are:

- An annual use limit of 75% of the valley entitlements at year 1 of the Plan (2003/04). This may be altered during the life of the Plan (upwards or downwards) to ensure long-term diversions remain at the level indicated by the WSP. The use limit may not be increased beyond 100% during the life of the Plan;
- Continuous accounting will be introduced, with a maximum account limit of 136%;
- The removal of off-allocation access (currently a 30 GL limit applies);
- The period under which translucent releases are made from Wyangala storage has been extended from 1 June - 31 October to 15 May - 15 November each water year;

- A requirement that the total inflow to Wyangala must exceed 250 GL each calendar year prior to commencement of any translucent releases; and
- A Water Quality Allowance of 20 GL to be set aside for salinity dilution and algal bloom mitigation;

Analysis undertaken by DIPNR suggests that under these revised management rules there is a 'no probability' of two or more years of Cap exceedance for the Lachlan Valley.

To assess whether the 1999/00 development levels configured in the Lachlan IQQM continue to represent 'current conditions', a review of the 1999/00 scenario against observed behaviour over the period 1997/98 – 2003/04 has been undertaken. This analysis suggests that the model over-estimates draw-down in the storage volumes.

The over-estimation of draw-downs is particularly evident over the last two years. This over-estimation is primarily due to changed river operation practices during the current drought.

Consideration is currently being given by DIPNR as to whether inclusion of the changed river operation practices during the current drought period within Cap modelling as well as current conditions modelling would represent a more appropriate estimate of Cap conditions.

The Lachlan WSP was gazetted on 21 February 2003, but has not taken effect until 1 July 2004. NSW is of the opinion that the new rules of access and operational rules contained in the Lachlan Valley Regulated Water Sharing Plan will constrain diversions over the next ten years. The rules of the plan, subject to irrigation development not increasing, will result in long-term diversions some 4% below the long-term Cap. Furthermore, it is expected that the rules will also result in annual diversions that only rarely exceed annual Cap targets.

The Plan contains 'growth management rules' which, in the case of growth, will automatically reduce access to water to the extent that the long-term diversions reduce back to the plan 'diversion limit'.

The IAG has previously noted that there has been a delay in introducing changes in the rules in 2002/03 to address breach problems encountered by this valley. The Lachlan, while still in debit, is well within the trigger requiring a more detailed audit by the IAG. Furthermore current long-term modelling suggests that the introduction of new management rules should ensure that the Lachlan Valley stays within the Cap. The IAG notes the amendments that have

been made to the modelled Cap targets taking into account new evaporation data, and the possibility that further adjustments will need to be made to the model to reflect the experience gained from the current severe drought conditions.

Murrumbidgee Valley

The 2003/04 water-year saw continuing low levels of water availability. The allocations prior to the summer cropping season were the lowest ever recorded in the Murrumbidgee valley. Additional releases from the Snowy scheme were made available from future releases to irrigators on a commercial basis. A total of 200 GL of 'borrow' from future releases was offered, and 180 GL was taken up by irrigators. Rice areas were less than half of the normally observed levels.

Diversions were well below the estimated annual Cap target by 122 GL, resulting in a cumulative Cap credit since 1997/98 of 470 GL. Over 900 GL of additional environmental releases have been made from storages during the Cap accounting period that would not have been made under 1993/94 management rules. This volume of additional release, and the continuing draw-down of Murrumbidgee storages in recent years have resulted in the large accumulation of Cap credits.

The Cap for the regulated sections of the Murrumbidgee Valley is currently assessed using the Murrumbidgee IQQM. This hydrologic model estimates Cap diversions for the regulated system below Burrinjuck and Blowering storages, and for the Lowbidgee Flood Control and Irrigation District.

Inflows to the valley and Burrinjuck dam in particular, have been exceptionally low over the last 2-3 years, with new record minimum inflows over the three years to the end of June 2004 for both Blowering (natural inflows) and Burrinjuck dams.

Implementation of the Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004 and is now currently in operation.

Remote sensing of rice areas indicates 38,884 ha of rice were irrigated in the Murrumbidgee Valley in the 2003/04 season. Historical rice area data indicates the continuing significant degree of reduction in rice area irrigated. At present, irrigated areas of other crops are not fully available.



A new state-wide project to provide a telephone (interactive voice response) and internet system for collecting data from water users, known as WICS (Water Information Communication System), will commence in 2004/05 with two pilot valleys, the Murrumbidgee and Gwydir valleys. This system will collect water orders, crop areas, and some infrastructure information as well as crop area information for all users outside of the main Irrigation corporations.

No estimate of areas of specific crops for the Lowbidgee are routinely collected.

A valley-wide survey of on-farm storages in 1997 indicated that private pumpers outside the main irrigation corporations had approximately 16 GL of on-farm storage capacity. During 2002/03 a survey of irrigation infrastructure between Darlington Point and Hay indicated that there was an additional 19 GL of on-farm storage in that reach. The reach from Darlington Point to Hay represents around half of the entitlement to private pumpers along the Murrumbidgee River.

This indicates that the total on-farm storage capacity outside of the main irrigation corporations is at least 35 GL. On-farm storages may be used for a range of activities in addition to harvesting of high river flows, such as re-regulating irrigation runoff, re-regulating rainfall runoff, and protection against occasional shortfalls in river supplies. For these reasons, and the relatively small volume of storage capacity, it is considered unlikely to significantly affect diversions.

No assessments of on-farm storage capacity were undertaken during 2003/04.

For the 2003 winter, including the last few months of 2002/03 and the first few months of 2003/04, storage levels at Burrinjuck dam fell to critically low levels and the ability to continue supply of water to towns below Burrinjuck, but above the Tumut River confluence, would have been prejudiced given continued dry conditions. To ensure continuing supply for town water from Burrinjuck, environmental releases of proportions of inflows under the 'translucent' and 'transparent' release rules were suspended, and the minimum release requirement was reduced from 300 ML/day to 250 ML/day. These emergency drought measures were brought into effect from 1 April 2003.

Due to critically low levels of water availability, severe water shortage provisions were invoked at the commencement of the 2003/04 water

year. Under these provisions the following actions were taken:

- the suspension of releases under the environmental flow rules (EFRs) from Burrinjuck storage was continued, and
- high security and Irrigation Corporation loss allocations were reduced early in the season to improve initial general security allocations.

These provisions were lifted in October 2003 when water availability improved to the point where announced allocations exceeded the lowest indicated by long-term modelling. Foregone environmental releases will be repaid when water availability improves.

The major change to the management rules since the commencement of Cap accounting in 1997/98 remains the introduction of the environmental flow rules in 1998.

In response to continuing record low allocation levels, another agreement was struck between Snowy Hydro Ltd, the NSW Government and Murrumbidgee Irrigation Corporation to advance future releases from the Snowy Scheme on a commercial basis. The offer was made to all general security users in the valley to purchase additional ('above target') water from Snowy Hydro via five options, up to a total cumulative volume of 200 GL.

As part of the agreement, Snowy Hydro were allowed the option of making additional releases in the current water-year, and any of the next five water-years, with these releases being accounted as part of the following year's release requirements. This effectively allows Snowy Hydro to make additional releases in a year without having to use its discretionary ('above target') water. These so-called 'flexibility volumes' are allowed up to a maximum limit of 200 GL for 2003/04, 150 GL for each of 2004/05 and 2005/06, and 100 GL for each of 2006/07 and 2007/08.

The agreement resulted in an additional 179.5 GL of releases of future year inflows being brought forward. The 180 GL borrowed from future year Snowy Hydro releases will be repaid by participating irrigators in two equal instalments in each of the following water years (2004/05 and 2005/06).

Snowy Hydro exercised the flexibility arrangements and released an additional 131 GL of water above the required release target, which was accounted as part of the 2004/05 releases rather than as 'above target' water.



The IAG have determined that the Snowy borrow arrangements for 2002/03 are not considered as part of Cap behaviour. Consequently, the arrangements for this year (2003/04), like those for 2002/03, are also considered outside of Cap. The observed Snowy releases for these two years have been adjusted to remove the effects of these commercial arrangements for the modelling of annual Cap targets.

The extremely dry conditions over recent years have produced record high river transmission losses, which the Murrumbidgee IQQM has under-estimated. A review of the model calibration for such dry periods was undertaken during 2003/04 and resulted in a reduction in both the modelled Cap targets and the cumulative Cap credit from last year's assessment. The review has also indicated areas where further improvements may be possible to simulation of transmission losses during these particularly dry periods.

The current results of the long-term and annual Cap simulations using the Murrumbidgee IQQM have been used to assess Cap compliance. A preliminary representation of the Lowbidgee district is included within the Murrumbidgee IQQM. The results for both the regulated diversions and Lowbidgee must still be considered preliminary until the model is independently audited under the provisions of Schedule F. The results presented exclude Snowy borrows from the Cap modelling which has the effect of reducing the current Cap credits.

The preliminary Schedule F accounting for 1997/98 – 2003/04 season indicates that the Murrumbidgee valley is cumulatively 470 GL below Cap. Long-term simulations indicate the average annual current condition diversions are 3% below Cap diversions.

Murray Valley

The Cap for the regulated sections of the Murray Valley is currently audited on an annual basis using the Murray Simulation Model (MSM). Re-calibration of MSM to better represent 1993/94 conditions commenced during 2002/03, and is not expected to be completed until mid 2005.

Allowing for an estimated 28 GL of unregulated stream diversions, total diversions for 2003/04 year were 1,311 GL, compared with an annual Cap diversion target of 1533 GL. The Snowy borrow in 2002/03 has been excluded from the Cap modelling which has the effect of reducing the current Cap credits. After allowing for trade of 38 GL, diversions in 2003/04 were 260 GL

below the Cap. The preliminary Schedule F accounting for the 1997/98 – 2003/04 seasons indicates that the NSW Murray Valley has a cumulative credit of 301 GL. Long-term modelling prior to re-calibration indicates that, were development and water access rules to remain as they currently are, the average annual diversions for the future will be 4% below the average annual Cap diversions if there is no further increase in the underlying demand.

As with other valleys, implementation of the Water Sharing Plan was delayed from 1 January 2004 to 1 July 2004, due to negotiations occurring for the *National Water Initiative*. The Plan was implemented on 1 July 2004, and is now currently in operation.

The 2003/04 water-year saw a continuation of low levels of water availability and use. Satellite imagery measurements of rice areas indicate 26,160 ha of rice was irrigated in the Murray Valley in the 2003/04 season, which is well below the average, but a significant improvement from the previous (2002/03) water-year.

There is no significant on-farm storage development in the NSW Murray Valley.

The 2003/04 Annual Allocation Plan for the Murray and Lower Darling valleys outlines the management rules that would apply during the water-year. There were no significant changes to water management rules from the 2002/03 water year.

In response to the record low allocation levels in 2002/03, an agreement was struck between Snowy Hydro Ltd, the NSW Government and Murray Irrigation Limited to advance future releases from the Snowy Scheme on a commercial basis. The offer was made to all NSW general security users in the valley above the Barmah Choke to purchase additional water. The only option considered financially viable for NSW Murray water users was an option to borrow of up to 160 GL of releases from 2003/04, to be released prior to 30 April 2003. The offer resulted in 133 GL of 2003/04 Snowy releases being brought forward. Late in the water-year, a further agreement was entered into by Snowy Hydro and NSW to borrow an additional 5 GL of future Snowy releases, which was virtually fully taken up.

Of the initial 133 GL borrowed, 9 GL was paid back prior to the end of the 2002/03 water year by participants with sufficient remaining water to do so. The 5 GL late season borrow was fully repaid during 2003/04.



Both agreements also provided for a one year 'roll-over' option to delay payback from 2003/04 until 2004/05 in the event that water allocations for 2003/04 were also poor. This provision was taken up by many irrigators in 2003/04, with repayment of 49.5 GL of the 124 GL outstanding being rolled over to 2004/05, on a commercial basis.

The MSM is currently undergoing recalibration to improve representation of 1993/94 and current conditions. This recalibration now is not expected to be completed until July 2005. Inclusion of NSW tributary inflows to the Murray system, as they would be under 1993/94 conditions, from the Murrumbidgee valley is also required. Provision of these inflows from the Murrumbidgee IQQM is currently under review, following the extremely dry conditions over the last few years. It is difficult to assess long-term outcomes from its current management rules until such time as the MSM recalibration is complete, and the impacts of these rules on irrigation demand are represented within MSM. However, preliminary estimates suggest that the existing Cap credit of 301 GL could be reduced by around 80 GL. This would still leave the Murray Valley in credit.

There is, however, a significant issue with the transfers from the Snowy Hydro to the Murray and the Murrumbidgee as there is potentially different treatment of these advances should a spill occur in the Murrumbidgee Valley.

The IAG recommends that such borrowings should be short-term and repaid with water having the same level of security. Any risk and consequence of increasing the Cap should rest with the irrigation community. The IAG notes that its recommendations on the treatment of the Snowy transfers have been adopted in the 2003/04 reporting.

4.3.3 Monitoring and Reporting

The issue of monitoring and reporting on the Cap has been discussed in previous reports by the IAG. The practical difficulty created by the later water-year (October to September) that had applied to the northern rivers has now been resolved by the adoption of a July-June year under the WSP's.

The use of IQQM models and NSW's own long-term modeling as a measure of the likely exceedance of the Cap by an individual valley under current management rules, are tasks which are highly data intensive. These models have proven to be particularly sensitive not only to past period water availability and off-take

statistics but also to other key drivers of valley behaviour including on-farm storage levels, crop areas, inflows from unregulated streams, climatic conditions and rainfall patterns.

As noted above, the IAG recognizes that the current severe drought conditions have thrown up some previously unforeseen data problems. This will now require significant additional effort in recalibrating the various IQQM models which are in different stages of finalisation. As a consequence, the IAG finds that it is not able to report authoritatively on all the valleys in the State. Furthermore given resource availability it is likely that the finalisation of these models has been delayed by at least 12 months and possibly longer.

The IAG has highlighted the implications of resource constraints in NSW in previous reports. The need for further recalibration now only serves to increase the problem.

To date the IAG has not received a report from NSW on diversions for the Intersecting Streams. Schedule F lists the NSW Intersecting Streams as a designated river valley. Diversion on these streams is believed to be small although it is understood that entitlements exceed current usage. Uptake of these entitlements could become an issue within the Council as Queensland moves to cap the streams (including the Narran River) upstream.

In its 2002/03 Report, the IAG identified the issue of monitoring diversions under the volumetric licences on unregulated streams.

Diversions from unregulated streams within NSW are generally not metered, and the majority have only recently been converted from area-based to volumetric licences. However, there are a small number of larger unregulated users below the regulated parts of the Macquarie, Gwydir and Border Rivers systems, close to the Barwon-Darling system, that have metered diversions available. These users received annual volumetric diversion limits prior to the general volumetric conversion process that occurred in 2000, and were metered similarly to Barwon-Darling users. The metered diversions from these users have not been included in diversions reported for either the regulated systems or the Barwon-Darling, and have been included in **Table 5**.

Un-metered use estimates are taken from the volumetric conversion process (2000), based on crop areas survey and assessed irrigation requirements. Metered use totals are from time-event meters as used in the Barwon-Darling system.

NSW has advised that it intends to Cap un-metered users according to the average 1993/94 – 1998/99 diversion estimate arising from the volumetric conversion process. No formal Cap management process has been established as yet for the metered users.

In 2003/04, the MDBC commissioned Marsden Jacob Associates (MJA) to undertake an audit of river diversions and inter-valley water-trade measurement and reporting systems employed by water agencies in all the MDB States and Territory. The 26 recommendations from that study have been directed to the MDBC and will be considered in that forum.

However, from a Cap monitoring and reporting context, and particularly in the light of concerns about the accuracy of the IQQM modelling undertaken for valleys across NSW, the IAG notes the findings and recommendations of MJA in relation to metering measurement accuracy. In particular, MJA has highlighted significant under- and over-reporting of off-takes using existing measurement devices. Remedial action has been recommended initially to be focused upon the 20% bulk major off-takes and largest 10%-15% of licences which account for 90% of licenced entitlements or allocations. Most of these larger off-takes are located in NSW.

The IAG supports the MJA view that, with the growing scarcity of water and consequentially rising value, there is a good governance obligation for State authorities and in particular NSW, to give urgent attention to improving the metering arrangements at least for the larger off-takes in the State. Improved information from these sources will also have important implications for the recalibration and accuracy of the IQQM modeling and the adherence to the Cap.

4.3.4 Administration of the Cap

NSW has adopted a series of water management and allocation rules for the purpose of managing the level of diversions within the Cap. These rules, in conjunction with the Environmental Flow Rules, are designed to ensure that diversions from the various valleys comply with the Cap in the longer-term.

NSW has introduced a number of management rules in recent years although in 2003/04 there have been few changes to these rules.

NSW has also developed Water Sharing Plans for a number of valleys. These plans provide the legislative basis for the implementation of management rules, and define a level of

consumptive water access for the next 10 years. The WSP includes a number of changes to environmental flow rules and other management rules for individual valleys which were to have taken effect from 2003/04, but were delayed until 1 July 2004. They currently are in operation.

Anomalies Arising from Drought

In the 2002/03 report, it was noted that New South Wales had requested that the IAG establish principles for the revision of Cap targets arising from management actions undertaken as a consequence of the severe drought.

Examples included but were not limited to:

- advances in 2002/03 from the Snowy Hydro Scheme to Murrumbidgee and Murray irrigators; and
- ‘pass through’ of water from the Gwydir and Border Rivers to Menindee Lakes.

In analysing this issue the IAG referred back to the definition of the Cap in the IAG Report *Setting the Cap* adopted by the Council in 1996:

“The Cap is the volume of water that would have been diverted under 1993/94 levels of development”.

Under the Cap, the amount of water that States would be entitled to divert in any year can be quantified using analytical models that incorporate weather conditions and the water allocation and system operating rules which applied in 1993/94.

The IAG notes that during 2003/04 questions have arisen as to the suitability of the climate-adjusted models that had been developed for use as part of the IQQM modeling in NSW. For a number of valleys, the historically unprecedented low levels of water caused by the current drought conditions have caused some concern about the ability of current climate-adjusted models to replicate ‘current’ conditions. As a result, DIPNR has been forced to re-examine data and recalibrate a number of the IQQM models, including the Commission approved model for the Lachlan Valley. This has the result of limiting the IAG’s ability to be able to report on performance under the Cap and potentially delay finalisation of IQQM models for all valleys NSW. The IAG is concerned by this delay and the impact that it has on the veracity of the Cap auditing process.



Table 5: NSW Unregulated Use Estimates (GL)

VALLEY	Un-metered Use		Metered Use					
	93/4 - 98/9 Average Use	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<i>Murray</i>	28	0	0	0	0	0	0	0
<i>Lower Darling</i>	0	0	0	0	0	0	0	0
<i>Barwon-Darling</i>	0	0	0	0	0	0	0	0
<i>Murrumbidgee</i>	42	0	0	0	0	0	0	0
<i>Lachlan</i>	15	0	0	0	0	0	0	0
<i>Macquarie</i>	35	3	22	16	21	15	0	9
<i>Namoi</i>	78	0	0	0	0	0	0	0
<i>Peel</i>	0	0	0	0	0	0	0	0
<i>Gwydir</i>	10	1	1	4	0	2	0	0
<i>NSW Border Rivers</i>	14	0	4	2	2	2	0	5



4.3.5 IAG Assessment

The IAG acknowledges the timely receipt of an informative report from NSW together with data in line with the Schedule F format.

Difficulties encountered with the data used in the IQQM modeling have again proved a practical problem to reporting on the performance under the Cap in 2003/04. Further recalibration of the models is necessary, but further delays the process whereby the IAG and the Council can be confident that the Cap is being applied correctly or whether corrective action is required.

The IAG has previously commented on the need to restore confidence in the accuracy and operation of the models. The onus is on NSW to allocate appropriate resources to address the need for the recalibration that has been highlighted by events in 2003/04.

The IAG also highlights the need for improvements in the metering of diversions and commends an early positive response to the recommendations of MJA on this matter. NSW has a majority of the larger bulk users suggested as initial targets for corrective action, and this should be a priority for administrative action by NSW in 2004/05.

Notwithstanding these difficulties with the models that have become more apparent during

the 2003/04 year, and the lack of IQQM models for some valleys, the IAG confirms that the Barwon-Darling/Lower Darling is in breach of the trigger for a Special Audit. The IAG also notes that once there is a final agreement on the Cap to apply to the Border Rivers (including Pindari), the IAG expects to be able to confirm that the Border Rivers are also in breach of the Cap. Other valleys appear to be within the Cap, although this can only be confirmed once the current recalibration of the IQQM models is completed.

The IAG is pleased to see progress in the negotiations between NSW and Queensland on the Cap for the Border Rivers. The development of management flow rules and the formal specification of a volumetric Cap for both sides of the border continues to be a matter for some urgency, particularly given the concern of the IAG regarding the possible exceedance of any Cap that is set for the Border Rivers. The development of management rules on the NSW side of the border is expected to take a further 12 months once NSW and Queensland can agree on Water Sharing Plans.

The IAG continues to encourage NSW in its discussions and negotiations with the ACT Government on the question of a possible combined ACT/NSW Cap for the area surrounding the ACT where it is likely ACT catchment resources will be called upon to

provide domestic water. The development and agreement to trading rules will be paramount to the successful conclusion of these negotiations.

Resolution of the question of unused entitlements for Intersecting Streams and Unregulated Streams has still not progressed. The IAG notes the advice provided on the quantum of off-takes on unregulated streams.

4.3.6 Conclusions/Recommendations

- Diversions in 2003/04 were 4105 GL compared to 4132 GL in 2002/03.
- IQQM Cap models have now been prepared for all river valleys, with the exception of the Murray and the Peel Rivers. However, these models require further recalibration prior to final approval under Schedule F.
- The Lachlan IQQM model has been approved by the Murray-Darling Basin Commission under the Schedule F procedures. The experience of the extended period of drought has raised the question as to whether changed operational behaviour during such periods of prolonged drought should be included within Cap models as well as current conditions modelling.
- The preliminary Schedule F accounting for the 1997/98 – 2003/2004 period indicates that diversions in the combined Barwon-Darling and Lower Darling Valleys are cumulatively 124 GL above Cap, and above the combined trigger for Special Auditing of 62 GL. Therefore a Special Audit is required for this valley..
- The Gwydir cumulative debit as at 2002/03 was 29 GL and technically no longer exceeds the trigger for a Special Audit. However, Cap estimates could not be prepared for 2003/04 because of the need for model recalibration. While it is considered that the Gwydir will not have exceeded the Cap trigger, the IAG cannot provide advice which can be corroborated by IQQM modelling.
- The IAG has been unable to assess the Cap compliance of the NSW Border Rivers because the Cap has not been defined in that valley. The IAG expresses concern that the Border Rivers will be found to be in breach once a Cap is defined.
- The Cap has not exceeded the trigger for other valleys in NSW, although again further recalibration work on the relevant models is required to confirm this observation.

- NSW should redouble its efforts to assign appropriate additional resources to the verifying and obtaining of data to allow the IQQM models used in the State to be reassessed, refined and recalibrated as appropriate.
- NSW should also announce a program of verification of meter readings by the largest off-takes and licenced water diverters in the State.
- Upon completion of the Integrated 1993/94 and current conditions model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam.
- The IAG encourages NSW to complete negotiations with the ACT over trading rules and other related matters in order to allow a Cap for the ACT to be defined.
- NSW should submit a monitoring report on the Intersecting Streams as required under Schedule F.



4.4 Queensland

4.4.1 The Cap

In line with the Council's earlier decisions, the Queensland Cap is to be established in accordance with the provisions of Schedule F following the completion of the Water Resource Planning processes.

Queensland has now finalised Water Resource Plans in all its Murray-Darling Basin valleys, and consequently has provided a framework with a strong legislative basis, that caps diversions from water courses, lakes, springs and overland flows. Water Resource Plans for the Border Rivers, Moonie, Nebine, Warrego and Paroo valleys were gazetted as subordinate legislation on 5 December 2003 and the final plan for the Condamine-Balonne was gazetted on 12 August 2004.

Under the *Water Act 2000*, draft Resource Operations Plans are currently being developed to implement the provisions of the Water Resource Plans. Diversion Caps for Queensland valleys will be developed and implemented as part of the monitoring, auditing and reporting provisions of the Resource Operations Plans. Resource Operations Plans for the valleys are expected to be released progressively over the next two years.

Administrative holds have been in place in most of the Queensland Murray-Darling valleys since early 1990's and no new licences have been issued since the Cap framework was established in 1995.

A moratorium on new works has existed in all Queensland Murray-Darling valleys since 20 September 2000. The Water Resource Plans continue the moratorium on the development of infrastructure related to water-harvesting licences until the Resource Operations Plans are finalised. The Water Resource Plans also continue the moratorium on works that would increase the take of overland flow until 1 February 2005 in the Condamine Balonne, and 1 July 2004 in all other MDB catchments. After these dates, new works that allow taking of overland flow water (other than for stock and domestic purposes) will be managed as assessable development under the *Integrated Planning Act 1997* and any growth in 'take' by those works will not be allowed under the Water Resource Plan. When implemented, the management rules under the Resource Operations Plan will ensure that there will be no increase in the average volume of water available to be taken.

4.4.2 2003/04 Diversions

The water-year in Queensland rivers runs from 1 October to 30 September. Diversion profile over the last 11 years for the total Queensland section of the Basin is summarised in **Table 6**.

Table 6: Queensland Basin Diversions (GL)

<i>Year</i>	<i>Diversions (GL)</i>
1993/94	336
1994/95	176
1995/96	528
1996/97	467
1997/98	741
1998/99	609
1999/00	541
2000/01	688
2001/02	341
2002/03	214
2003/04	804

The categories of 2003/04 diversions are summarised in **Table 7**.

Table 7: Queensland Basin Diversions Categories (GL)

<i>Diversion Category</i>	<i>Diversion (GL)</i>
Irrigation Area Channels	66
Private Diversions	60
Water Harvesting	651
Unregulated Stream Licences	13
Urban, Industrial & Stock	14
Total (GL)	804

Except for good general rainfalls in January 2004 and consistent below average rainfalls throughout the 2004 winter months, rainfall for the 2003/04 water-year has been scattered and inconsistent across the Queensland section of the Basin. The mid-western parts of the Queensland Murray-Darling Basin received most benefit from the scattered rainfall events with above average falls in the Border area in summer months sometimes extending north-west out towards Charleville. Overall the dry winter months balanced any above average periods to result in total rainfall for the 2003/04 water-year ranging from average in the mid western area to up to 100 mm below average elsewhere.

With very little replenishment during the 2002/03 water-year, most major storages entered the water-year at critical levels with storage capacity generally less than 15%. The exception is Beardmore Dam that filled from flows in April 2003 and entered the year at around 60% of capacity. Following limited water-harvesting opportunity in 2002/03, offstream storages (ring tanks) in all catchments started the year with little water in storage.

The summer rainfall patterns which did eventuate resulted in reasonable stream flows. Both the Border and the Condamine Balonne were below average for the year with the western streams around average.

- Flows in the Border Rivers at Goondiwindi were around 50% of the long-term average of 850 GL. Total flows out of the Border Rivers into New South Wales were significantly boosted by an estimated 200 GL contributed by the Weir River downstream of the Goondiwindi gauging station. Average annual contribution from the Weir River is in the order of 160 GL.
- The situation improved in the Condamine Balonne catchment with total flows through St George around 60% of the long-term average of 1150 GL. Flows through Chinchilla were almost 40% of the long-term average of 587 GL.
- The Moonie catchment benefited from the January rains with 220 GL flowing past Fenton just upstream of the NSW border. Long-term average annual flow through Fenton is 166 GL.
- Flows in the Warrego River catchment were slightly improved over the last couple of years with 339 GL flowing past Cunnamulla, i.e., approximately 90% of the long term average of 375 GL.

- Paroo River flows were slightly better than average with 577 GL recorded past Caiwarro. Average annual volume of flow is 538 GL.

Flows and related water-harvesting are described in detail for the various valleys as follows.

Condamine-Balonne

Upper Condamine (Darling Downs)

The summer rainfall saw several smaller flows in the Condamine River upstream of Chinchilla Weir. Flows in December 2003 and January 2004 peaked at around 20,000 ML/day followed by a few smaller fresh flows during March. Chinchilla Weir entered the year around 50% capacity and filled in the December flows. Water-harvesting diversions upstream of Chinchilla are estimated at 102 GL.

Total volume of flow through Chinchilla for the year was 225 GL. Average annual flow is estimated at 587 GL.

Balonne

Beardmore Dam filled from around 40% capacity in the smaller flows evident in the upper catchment in December 2003 and limited access was announced for water-harvesting. The good general rains across the catchment in January 2004 saw flows through St George peaking at about 65,000 ML/day and triggering the first significant water-harvesting event for over two years. Approximately 266 GL was diverted through water-harvesting from this flow. A further 65 GL was taken from a smaller flow peaking at about 15,000 ML/day in March 2004. Total diversion for water-harvesting for the year was 341 GL — 10 GL between Chinchilla and Beardmore storage, and 331 GL from Beardmore storage downstream.

Total flow through St George was 666 GL for the year. Long-term average annual volume of flow at St George is 1,152 GL.

Border Rivers

The start of the year saw limited flows in the Macintyre River peaking at 6,000 ML/day at Goondiwindi in October and December 2003. The December flow was boosted by flows peaking at 9,000 ML/day in the Weir River downstream of Goondiwindi. Queensland allowed limited access (1 day) to these flows with access increased up to 5 days downstream of the Weir River junction.

The better general rainfall in January 2004 saw an event peaking at 65,000 ML/day in Goondiwindi, 16,000 ML/day from the Weir River, and up to 12 days of access announced for



water-harvesting. Further isolated rainfall in the Weir River catchment triggered flows peaking at 10,000 ML/day in the Weir River in March 2004. Water-harvesting access was announced for both States downstream of the inflow.

Total water-harvesting within the Queensland section of the Border catchment was 170 GL. Approximately 88 GL of this was diverted from better than average flows in the Weir River.

Total volume of flow through Goondiwindi for the year was 425 GL with a further net volume of 200 GL contributed by the Weir River downstream. Average annual volume of flow through Goondiwindi is 852 GL.

Moonie

Moonie River flows also reflect the good rainfalls in January 2004 with a peak flow of 23,000 ML/day and a total of nearly 200 GL recorded for the month at the Fenton gauge. Other smaller flows in December 2003 and March 2004 gave a net total volume of 220 GL past the Fenton gauge during the year. The average annual volume of flow at this gauging station is 166 GL.

The better than average flows in the Moonie allowed off-stream storages to fill for the first time in 3 years with approximately 30 GL of water-harvesting diversions for the 2003/04 water year.



Warrego

Flows in the Warrego were also related to the January rainfall with a peak of 50,000 ML/day passing Cunnamulla. Slightly above average rainfalls in the northwest also contributed to a February event, which peaked at just less than 10,000 ML/day.

Water-harvesting diversion is estimated at 8 GL for the year into an estimated 13 GL of offstream storage.

Total flow recorded through the Cunnamulla gauge for the year was 339 GL, which is slightly below the long-term average of 375 GL. Flow records at Cunnamulla are limited (12 years). An upstream gauge in the Warrego River at Wyandra with longer-term records suggested total recorded flow of 333 GL for the year as against the long-term average of 529 GL. Flows into two major distributaries and wetlands/lakes downstream of Wyandra account for the difference in values at these two locations.

Paroo

As with the other catchments, significant flows occurred in January peaking at about 87,000 ML/day at Caiwarro, approximately 60 km upstream of the Queensland – New South Wales border. Total volume of flow through Caiwarro for the year was 577 GL compared to an average annual flow of 538 GL. There is no water-harvesting development on the Paroo and negligible irrigation development.

Water-harvesting

Volumes harvested from the more developed catchments in the October 2003 to September 2004 period are summarised in **Table 8**.

Table 8: Water-harvesting

<i>Location</i>	<i>Average Annual Flow Volume (GL)</i>	<i>2003/04 recorded flow Volume (GL)</i>	<i>Approximate volume harvested (GL)</i>
Condamine River @ Chinchilla			
Condamine River U/S of Chinchilla	587	225	102
Balonne River @ St George			
Condamine/Balonne from Chinchilla to the Qld/NSW border	1152	666	341
Macintyre River @ Goondiwindi (Inflow includes Weir River) (Border Rivers Catchment)	852	425	170
Total (Condamine Balonne & Border only)			613

Adding the volumes harvested in the less developed catchments gives a total of 651 GL water-harvesting diversion for the year.

Storage capacities provided in October 2002 continue to be the most accurate figures available for off-stream storage in the Queensland section of the Basin (**Table 9**). Information on irrigation infrastructure will improve as the Water Resource Plans are implemented. All of the plans have initiated a notification process for overland flow works used for irrigation whereby owners of these works are required to notify details to the Department within a specified time frame. A lot of these works are used in conjunction with licenced diversions from watercourses so the Department will receive additional information related to licenced diversion by default.

Irrigation

Most major 'in-stream' storages entered the year at less than 15% capacity. Leslie Dam which supplies the Upper Condamine Water Supply Scheme was the lowest at 5% with no announced allocation, Glenlyon Dam which supplies the Dumaresq Water Management Area was at around 10% capacity with less than 4,000 ML available for Queensland irrigators and Coolmunda Dam in the Macintyre Brook Water Supply Scheme was at slightly better than 10% capacity.

The exceptions were Beardmore Dam, which supplies the St George Water Supply Scheme and Chinchilla Weir on the Condamine River. Both storages started the year at around 50 - 60% capacity following inflows in April 2003.

All storages, with the exception of Leslie Dam, which received minimal inflows, benefited from inflow during December 2003 and February 2004. Chinchilla Weir and Beardmore Dam filled; Coolmunda Dam reached 75% capacity and Glenlyon Dam 25%. Leslie Dam continues

to be at critical levels, Glenlyon Dam about 25% and the remainder at around 50% capacity at the end of the water year.

The St George Water Supply Scheme (Beardmore Dam) and the Dumaresq Water Management Area (Glenlyon Dam) operate under capacity share and continuous accounting arrangements respectively. The water stored in these storages is an indicator of available allocation. Announced allocations in the other schemes at the start of the year ranged from nil for irrigation allocations in the Upper Condamine Water Supply Scheme (Leslie Dam) to 3% for the Macintyre Brook Water Supply Scheme (Coolmunda Dam) and 15% for the Chinchilla Water Supply Scheme (Chinchilla Weir). Allocations were announced upwards to 100% for the Macintyre Brook and 90% for Chinchilla Weir following December 2003 and January 2004 inflows. Leslie Dam storage improved slightly in the January 2004 rainfalls but not sufficient to allow a revised announced allocation. Allocation water taken in the Upper Condamine Water Supply Scheme was all taken from natural flows in the Condamine River.

Approximately 122 GL of a total nominal allocation of 212 GL was delivered through the major irrigation schemes for the year. A further 4 GL was temporarily transferred from property owners in New South Wales for use on their Queensland properties on the Border Rivers.

Unregulated Irrigation

This usage is small in comparison with water diverted by water-harvesting or captured in scheme storages. Unregulated irrigation largely depends on the availability of water from naturally flowing streams and naturally occurring waterholes, with most usage from the perennially flowing streams on the western slopes of the Great Dividing Range. The prolonged drought conditions continued to seriously affect flows in these streams coming



Table 9: Private Storage Development Capacity (GL)

<i>Catchment</i>	<i>Sept 1999</i>	<i>Sept 2000</i>	<i>Sept 2001</i>	<i>Sept 2002/03/04</i>
Condamine/Balonne	822	1273	1330	1333
Border	188	267	329	332
Moonie	10	18	21	21
Warrego/Paroo	6	8	12	12
Overland Flow	120	160	180	180
Total	1146	1726	1872	1878

into the year and most were subject to total bans through to the December 2003, January 2004 rainfalls. These bans were lifted across the board in January 2004 but were imposed again in the Condamine catchment from July 2004 onwards. It has not yet been necessary to re-impose the bans in the Granite Belt.

Unregulated irrigation usage for the 2003/04 year is estimated at approximately 13 GL.

Urban, industrial, and stock usage remains fairly static in the catchment as it is generally allocated as high security water and is normally able to be reliably supplied. Total usage for the 2003/04 year is estimated at 14 GL, most of which 12 GL is accounted for as town water supply.

4.4.3 Progress with the Planning Process

Queensland has finalised Water Resource Plans in all its Murray-Darling Basin valleys in accordance with Queensland's *Water Act 2000*. Water Resource Plans for the Border Rivers, Moonie, Nebine, Warrego and Paroo valleys were gazetted as subordinate legislation on 5 December 2003 and the final plan for the Condamine-Balonne was gazetted on 12 August 2004. The plans provide a consistent approach to management across the catchments, while taking the specific issues of each catchment into account.

The Water Resource Plans (WPR) are a package of strategic-level proposals for the sharing of water between consumptive use, the environment and downstream use, the conversion of existing entitlements to volumetric tradable water allocations, identification of unallocated water to address critical future water requirements and managing the 'take' of overland flow water. In addition, the plans provide for monitoring and reporting on achieving the plan outcomes and for a water trading system to be established.

Draft Resource Operations Plans (ROP) are currently being developed to implement the provisions of the water resource plans. The Resource Operations Plans include rules for converting existing water entitlements to volumetrically specified water allocations, rules for trading water allocations, rules for sharing flow events, rules for operating water infrastructure, rules for releasing unallocated water where identified by water resource plans, provisions for environmental management, and monitoring and assessment programs.

As part of the ongoing planning process, community, water users and stakeholder groups in each catchment have been engaged, through consultative groups and individually, to work through various issues. These discussions, including supporting technical work, are at various stages in different plan areas.

Moratoria on works have existed in all Queensland Murray-Darling valleys since 20 September 2000. While the moratoria have effectively placed a Cap on works and associated diversions, the Water Resource Plans provide the framework for capping all diversions from watercourses, lakes springs and overland flows. The moratoria will continue to have effect until the Water Resource Plans have been implemented through the Resource Operations Plans, which will set out the day-to-day management rules for capping take.

4.4.4 Current Status of Water Resource Plans

The status of each Water Resource Plan is provided below.

Border Rivers, Moonie and Warrego/Paroo/Bulloo/Nebine

In the Border Rivers catchment, an Intergovernmental Agreement (IGA) is being developed jointly with New South Wales and in consultation with stakeholders. As a first step in developing a formal agreement between New South Wales and Queensland for the sharing and management of water resources in the Border Rivers, the Border Catchments Ministerial Forum has agreed on a set of key principles put forward by the Border Catchments Standing Committee to form the basis for developing an IGA.

In summary, the Statement of Principles proposes that a new Intergovernmental Agreement between Queensland and New South Wales for the Border Rivers will:

- Establish state water sharing arrangements;
- Provide each State with surety to its right to use water;
- Establish common environmental flow management on those streams that are shared between the states;
- Establish an adaptive approach to extraction and environmental flow management that ensures environmental protection while supporting economic output;
- Provide for adequate flows to the Darling Basin downstream of Mungindi;

- Establish a framework for interstate trading of water entitlements; and
- Ensure consistency with the Murray-Darling Basin Agreement and initiatives

The Border Catchments Standing Committee and its Working Groups have been working through detailed issues and options on various elements of the IGA supported by the hydrologic modelling team and stakeholder consultation mainly via the Inter State Water Management Working Group. These elements include water sharing and access, environmental flow rules, extractions from floodplain flows, interstate water trading, water accounting, and monitoring and reporting.

The States will give effect to the IGA through their respective water resource planning processes. Accordingly, in Queensland, the intent of the IGA is reflected in the finalised Water Resource Plans for the Border Rivers, Moonie and Warrego-Paroo-Nebine catchments. For example, the final plan provisions include environmental flow objectives including end-of-system flow targets, strategies for achieving plan outcomes, extraction Caps on all water entitlements, dealing with unallocated water, tight control of overland flow extractions, and monitoring and reporting requirements.

The agreed provisions in the IGA relating to joint management of water resources (including, for example, environmental flow rules, water sharing or access rules, and water trading and accounting systems) as well as provisions in the final Water Resource Plan will be operationalised in Queensland through the Border Rivers Resource Operations Plan.

The planning process is at an advanced stage in Warrego/Paroo/Nebine and Moonie catchments, with the draft ROPs expected to be released for public review in late 2004. It is expected that both these ROPs will be finalised in mid 2005 following a review of submissions, consultation and an independent referral panel process, as per *Water Act 2000*.

Condamine-Balonne

The Water Resource Plan was finalised following a long period of community consultation.

The Plan has the following key features:

- Performance indicators to ensure that decisions made under the Resource Operations Plan do not adversely affect the amount of water available to the environment or existing water users;
- The conversion of existing water authorisations to volumetric tradable water allocations, with volumetric limits on the amount of water that can be taken;
- Event management rules to enhance low and medium flow events in the Lower Balonne as well as improve water availability to the Narran Lakes;
- The development of water sharing rules for Water Supply Schemes in the catchment;
- A continuation of the moratorium on new works to take water from a watercourse pending finalisation of the Resource Operation Plan for the catchment;
- The formation of a Ministerial Water Advisory Council for the lower Balonne that would include NSW representation (and for other parts of the catchment if required) to provide advice on event-based management, ecological monitoring, scientific research and development of the Resource Operations Plan;
- The regulation of the take of overland flow water throughout the catchment; and
- Provisions for a formal review after five years. This formal review must include information on a number of matters, including information on the progress in the research and monitoring of the Plan outcomes for the Narran Lakes and the Culgoa floodplain.

The process of developing a draft Resource Operations Plan is at an early stage. Key activities to date have included initial community consultation and groundwork towards the establishment of the Lower Balonne Water Advisory Council as soon as possible.

A Cap for the Queensland portion of the Basin is unlikely to be available before 2006/07.

All WRP/ROPs are based on the assumption that diversions will be measured and an extensive metering program has commenced with a pilot on the Weir River. This will ensure accurate measurement of diversions from regulated streams and water harvesting but still raises issues of measuring overland flow harvesting and end of stream flows.



4.4.5 IAG Assessment

Diversions of 804 GL were the highest recorded even though flows were average. This reflects the very large increase in water storage capacity since 1995 through growth within existing licences. No new licences have been issued since before 1995. Average diversions will grow significantly in average years following the increase in storage capacity. There will also be substantial peaks in diversions in high flow years.

The introduction of the moratorium on the construction of new water-harvesting storage capacity in September 2000 has been effective with capacity stabilised at 1878 GL.

After a long gestation period the Water Resource Plans for the Border Rivers, Moonie River and Warrego/Paroo/Bulloo/Nebine became law in December 2003 and for the Condamine-Balonne in August 2004.

Preparation of Resource Operations Plans for the Moonie and Warrego/Paroo/Bulloo/Nebine has commenced and a draft is expected to be available for community consultation in December 2004 and finalised July 2005. Valley Caps for these valleys are expected to be available in 2005/06.

Preliminary work on the Resource Operations Plans for the Border Rivers and Condamine-Balonne has commenced and are expected to be finalised over a two year period. Valley Caps for these two valleys are unlikely to be available before 2006/07.

The MDBC made a submission in March 2004 to Queensland on the draft Condamine-Balonne Water Resources Plan. Following finalisation of the Plan Queensland officers briefed the IAG in October 2004 on changes to the draft Plan and it was apparent that the issues raised in the MDBC submission did not lead to significant changes in the final Plan. The IAG notes, however, the changes in the final Plan which include tightening the regulation of overland flows in the Lower Balonne; strengthening of medium flow event rules in the Lower Balonne; strengthening of inter-state interests in Lower Balonne implementation and review processes; and clarifying mechanisms for future adjustments to the Condamine-Balonne Plan.

The rules for managing low flows in the lower Balonne to achieve an environmental outcome for Narran Lakes were modified to simplify operation of the system. These have no adverse environmental impacts and could increase environmental flows. As the Water

Resource Plan is now law the IAG did not consider that further comment on the Plan was warranted. One significant feature of the Resource Operations Plan when implemented is that licences for harvesting of overland flow will be set at the lower of nominated historical operating capacity or audited capacity. This is expected to significantly reduce overland flow diversions under medium flow conditions.

Progress on the Resource Operations Plan for the Queensland component of the Border Rivers will depend heavily on progress on an Inter-Governmental Agreement (IGA) to agree on policies, principles and operating rules. The IAG considers that resolution of these issues is critical and encourages ongoing discussion.

A strategy and resourcing for metering diversions is in place. This will enable accurate measurement other than overland flow diversions and end-of-valley flows.

Given the experience with models in other states the IAG is of the view that early audits will ensure there is a strong and reliable technical basis for monitoring and auditing compliance against Cap targets as well as environmental flow outcomes. There has been significant progress in establishing a legal framework for managing diversions and the achievement of environmental outcomes. Substantial work however remains to be done.

4.4.6 Conclusions/Recommendations

- Diversions are estimated at 804 GL and are the highest recorded since 1993/94. This was in a year with average rainfall and flow and reflects the very large increase in water storage capacity.
- Growth in off-stream storages stopped since the introduction of a moratorium on construction in September 2000 and remains at 1878 GL.
- The Water Resource Plans for the Border Rivers, Moonie and Paroo/Warrego/Nebine became law in December 2003 and for Condamine-Balonne in August 2004.
- Draft Resource Operations Plans for the Moonie and Warrego/Paroo/ Nebine are expected to be available for public consultation in December 2004 with a view to finalisation by July 2005. Preliminary work has commenced on the Resource Operations Plans for the Border Rivers and Condamine-Balonne.

- Finalisation of the Border Rivers Resource Operations Plan is dependent on the outcome of negotiations under the Inter-Governmental Agreement between Queensland and New South Wales and these should be finalised expeditiously to enable Caps to be established for both the Queensland and New South Wales Border Rivers.
- Queensland will have good estimates of diversions as the strategy has been developed and resourced to measure water diversions through meters except for overland flows.
- Queensland is developing Resource Operations Plan models and it is recommended that these be submitted for audit and subsequent accreditation. These models should allow auditing of compliance against Cap targets as in other states, and progress against end-of-valley flow or environmental objective targets.
- A Cap for valleys in the Queensland portion of the Basin are expected to become progressively available over 2005/06 and 2006/07.



4.5 Australian Capital Territory

4.5.1 The Cap

The ACT became a participant in the Murray-Darling Basin Commission in March 1998. At that time the ACT Government undertook to participate in the Cap initiative. At Council Meeting 33 - 9 May 2003 the ACT Government reaffirmed their commitment to the Cap. However, there is yet to be a decision as to what is to be the ACT's Cap. Net ACT consumption is approximately 0.3% of overall Basin water use. The ACT Government however, has stated that it rejects the concept of a Cap based on historical use.

The major consumptive use of water in the ACT is the urban water supply to Canberra and Queanbeyan. Net diversions since the mid-1980s for urban water supply have been around 31 GL per year with an additional 5 GL per year estimated for all other consumptive diversions (Table 10).

In 2003/04 net diversion was impacted by water restrictions introduced in response to the drought and the damage caused by the January 2003 bushfires on the catchment areas.

Around 50% of the urban water diversions in the ACT are returned to the Basin by way of the Lower Molonglo Water Quality Control Centre (WQCC) and Queanbeyan Sewage Treatment Works (STW). As a consequence net diversions are currently used as the accepted means of assessing the use of water for consumptive purposes in the Territory.

4.5.2 Administration of the Cap

The *ACT Water Resources Act 1998* contains provision for the licensing and measurement of extractive water use from both groundwater and surface water. The ACT Government has implemented this licensing procedure and undertaken a metering program such that both groundwater and surface water will be metered. Despite anticipated completion of this activity in 2003/04, work is still continuing on the testing of metered usage results which will allow the ACT Government to report directly on groundwater extractions. This in turn will allow confirmation of the 'other diversion' usage reported in Table 10. Currently an estimate has been used. The *Act* also requires that environmental flows must be provided for before any other use. Environmental flow guidelines provide for the protection of flows

Table 10: Diversions for Consumptive Use within the ACT and Queanbeyan (GL/year)

Year	Gross Diversion	Less returns to system			Net Diversion
		Lower Molonglo WQCC	Queanbeyan STW	Other Diversions	
1989/90	65.4	29.9	3.4	5.0	37.2
1990/91	77.3	33.1	3.4	5.0	45.8
1991/92	60.0	33.3	3.4	5.0	28.4
1992/93	50.2	34.8	3.4	5.0	17.0
1993/94	59.4	32.7	3.4	5.0	28.3
1994/95	60.6	30.1	3.4	5.0	32.1
1995/96	53.3	32.2	3.5	5.0	22.5
1996/97	61.8	33.7	3.4	5.0	29.7
1997/98	73.1	30.7	3.2	5.0	44.2
1998/99	54.4	32.7	3.4	5.0	23.2
1999/00	58.0	32.6	3.9	5.0	26.5
2000/01	63.0	30.3	3.9	5.0	33.8
2001/02	70.9	30.6	3.8	5.0	36.4
2002/03	65.8	28.4	2.3	5.0	40.1
2003/04	57.8	27.8	2.2	5.0	27.8

up to the 80th percentile and, except in water catchments, only 10% of flows over the 80th per centile are available for consumptive use. Of the total ACT water resources of 494 GL per year these guidelines allocate an average of over 272 GL to the environment leaving around 222 GL (gross) notionally available for consumptive use.

4.5.3 Issues with Adoption of the Cap

In December 2002, the ACT Government announced that it would develop a comprehensive Water Resources Strategy to be formalised as a new Water Resources Management Plan under the *Water Resources Act*. In July 2004, the ACT Government finalised its water strategy, 'Think Water, Act Water'. In this statement, the ACT Government recommitted itself to the Cap and set out its major aims and objectives in terms of future water use for consumptive and environmental purposes. This commitment to the Cap has been further reinforced by the ACT Government's announcement that it wishes to renegotiate its membership of the Murray-Darling Basin Commission such that it be given full membership recognition.

As part of its development of a proposed Cap for the ACT, the ACT Government has been engaged in discussions with NSW over the last 12 months on an MOU for a joint ACT/NSW Cap covering the ACT and surrounding areas such as Queanbeyan. The ACT Government is seeking to negotiate a complementary Cap arrangement to that proposed in NSW, recognizing that the ACT has sovereign rights to water in the Territory and in the Molonglo and Queanbeyan catchments. In particular, the ACT Government has referred to the possible negotiation of a Cap incorporating the NSW concept for its urban centres of a 'reasonable entitlements' model similar to that used by NSW for its urban centres.

The ACT Government has advised the Murray-Darling Basin Commission that it rejects the use of historical information as the basis for the Cap, and has proposed the adoption of four additional principles to be read in conjunction with the seven principles adopted by the IAG for the purpose of assessing Cap targets. These additional principles are:

- at least broad parity between jurisdictions and towns with equivalent conditions;
- efficiency (that is, the need to reinforce rather than undermine the incentive for responsible action);
- sustainable river environment throughout the Basin over the medium to long-term; and
- recognition of the legal position of the ACT and its legislative arrangements with the Commonwealth and NSW, including existing water rights.

The ACT Government has advised that negotiations have proceeded satisfactorily with the NSW Government, but at this time there has been no final agreement. It is expected that with the completion of the election cycle in the ACT and the commencement of a new four year term for the ACT Government from October 2004, negotiations with NSW can be expected to recommence early in 2005. The incoming Government in the ACT has announced that it will appoint a Minister for Water.

4.5.4 Discussion of Issues

The IAG has discussed the issue of the setting of a Cap for the ACT in previous reports and has also commented on the additional principles proposed by the ACT Government (see IAG 2002/03 Report). The IAG welcomes the progress that has been made in the negotiations with NSW and notes the ACT Government has given consideration to the discussion by the IAG on the additional four principles in its 2002/03 Report. The IAG anticipates that the ACT will

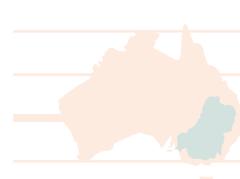


Table 11: An example of a Cap applied to the ACT - GLs Diversions since July 1997 compared with a notional 38 GL Cap

<i>Proposed Long-term Diversion</i>	<i>2003/04 Climate-adjusted Target</i>	<i>Diversion</i>	<i>Credits (proposed climate-adjusted Cap target less diversion)</i>		<i>20% Long-term Cap Diversion Trigger</i>
			<i>2003/04</i>	<i>Cumulative Since 1 July 97</i>	
38	42	28	14	50	-8

be able to bring forward its proposal for a Cap during the next twelve months noting that the ACT Government will also, during this period, be considering alternative water sources for the ACT.

4.5.5 Monitoring and Reporting

The ACT has established a system of licences for all users of water in the ACT and these will be climate-adjusted volumetric licences. The ACT will be able to report its consumptive usage against information provided by licence holders. As ACTEW Corporation will be the main licenced user of water from the system, the level of accuracy from this monitoring process should be high.

4.5.6 2003/04 Diversions

Net diversions by the ACT in 2003/04 were 27.8 GL. As an example of the assessment that might be made in the future, this diversion has been compared with the level of diversion expected under a 38 GL long-term Cap which was referenced by the IAG in its 1999/00 Report.

The 2003/04 diversion is 14 GL below the 42 GL annual climate-adjusted Cap target. **Table 11** summarises the ACT's performance against the 38 GL Cap since July 1997. It reveals that had the ACT adopted a Cap based on 38 GL, it would have already built up a credit of 50 GL.

It is acknowledged by the IAG that the ACT Government has rejected the 38 GL Cap proposed and that this table is used for illustration purposes only.

4.5.7 Other Issues

The ACT has proposed the adoption of four additional principles for use in determining the level of the Cap. The IAG has considered these principles in the context of the existing principles established and used to set the Cap across the total Murray-Darling Basin and has presented its views in its 2002/03 Report. In general these additional 'principles' can be addressed in the context of the existing seven principles recommended by the IAG and adopted by the Council. Furthermore, in practice the IAG has addressed the issues that the ACT Government seems to be raising and the experience gained from the application of the Cap in other jurisdictions should serve as an encouragement to the ACT Government that its objectives can be addressed within the overall context of the spirit and practical application of the Cap.

The IAG has welcomed advice from the ACT officials that they have given consideration to the Adelaide experience as a practical demonstration of the way in which growth issues have been addressed in the context of the Cap. The IAG notes that under a 'reasonable entitlements' model of the type being applied in NSW, and which appears to be favoured by the ACT, additional water requirements for urban areas are met by reducing water availability for other consumptive use within the Basin, and it is this principle that is being applied in Adelaide.

Appropriate trading rules will need to form part of such an arrangement to enable the ACT to obtain access to additional water as is required for population growth in the future. This is one of the issues that the ACT Government is seeking to negotiate with the NSW Government.

The ACT Government has also highlighted the need for some recognition to be given to water saving efficiencies that it has achieved over the last decade. The IAG is in-principle, supportive of the benefits of water saving efficiencies being at least in part shared with the relevant jurisdiction in addition to being available for environmental purposes.

4.5.8 IAG Assessment

The IAG notes the ACT's commitment to the Cap and to the principles behind the Cap. The IAG also notes the desire by the ACT to reach a resolution of the Cap for the ACT. Once the Cap is agreed, the ACT has the monitoring and reporting arrangements in place which will provide appropriate data for reporting under Schedule F.

In its 2002/03 Report, the IAG made a number of observations on the additional four principles that the ACT Government wishes to adopt. While there has been no final proposal of the Cap provided to the IAG or the Council, the IAG notes that its previously reported observations appear to have been considered by the ACT officials.

The ACT Government has placed great stress upon receiving appropriate recognition for water efficiencies achieved. The IAG notes that as part of the 'Think Water, Act Water' strategy, the ACT Government has set targets for future water savings, viz:

- 25% reduction in per capita consumption of mains (potable) water by 2023; and
- increase the use of treated wastewater (reclaimed water) from 5 per cent to 20 per cent by 2013.

The ACT, as the nation's capital, could ultimately set the standard for water conservation and waste water re-use for other cities across Australia. Similarly, the adoption of a Cap for the ACT will be an important symbolic gesture, not only to other parts of the Basin, but to the nation as a whole. The ACT Government should therefore be encouraged to re-engage in discussions with the NSW Government on outstanding matters as a prelude to the setting of the Cap. This will be particularly important as the ACT Government considers alternative water sources to guarantee the level of security required for its primarily urban requirements. In particular the IAG notes that amongst options under consideration is the possible building of a new dam, enlarging the Cotter Dam, or the pumping of water from the Murrumbidgee to supplement inflows into the Googong Dam. All of the options under consideration involve the possible diversion of additional water in the ACT and will have potential environmental consequences and implications for the availability of water elsewhere in the Basin. Conclusion of discussions on the setting of a Cap would appear to be an important element of any final decision on the need for and the form of any new water diversions arrangements for the ACT.

In this context, the IAG agrees with the views expressed by the ACT Government, namely that the ACT requirements must be seen in the context of the end-of-valley flow arrangements and the Cap that is to apply to the Murrumbidgee system, and not in an isolated context.

4.5.9 Conclusions/Recommendations

- No Cap presently exists for the ACT.
- Net diversions of 27.8 GL in 2003/04 are below the average usage between 1989 and 2001 of 31 GL and are also less than a climate-adjusted annual Cap target of 42 GL. The ACT would have a cumulative credit of 50 GL if the Cap of 38 GL proposed by the IAG had applied since July 1997.
- The IAG encourages the ACT and NSW to complete their negotiations on the form of a Cap to apply to the ACT and the surrounding region.
- The IAG supports the concept of the ACT Cap being seen in the context of a wider valley Cap and notes the implications of this on the current review of the need for and form of additional water capture arrangements for the ACT.



5. Diversions from the Murray-Darling Basin in 2003/04

Murray-Darling Basin diversions in 2003/04 totaled 8,765 GL. This total was only 68% of the record diversion of 12,964 GL in 1996/97 and reflects the restrictions to supply caused by the severe drought. Of the total water diverted, New South Wales diverted 46.8%, Victoria 36.7%, South Australia 7%, Queensland 9.2% and the Australian Capital Territory 0.3%. Diversions for the individual valleys are presented in **Table 12**.

Annual diversions since 1983 are plotted in **Figures 1 and 2**. In 21 years since 1983/84 the diversions in the Basin were the second lowest; diversions in NSW were the lowest, in Victoria the fifth lowest, in SA the ninth highest, in Queensland the highest and in the ACT the sixth lowest on record.

Table 12: Murray-Darling Basin Diversions in 2003/04

<i>System</i>	<i>Total Diversion (GL)</i>	<i>Percentage of Basin Diversion (%)</i>
New South Wales		
Border Rivers	114	
Gwydir	170	
Namoi/Peel	173	
Macquarie	210	
Barwon-Darling	269	
Lower Darling	23	
Lachlan	59	
Murrumbidgee	1776	
Murray	1311	
Total NSW	4105	46.8%
Victoria		
Goulburn/Loddon/Broken	1592	
Campaspe	70	
Wimmera-Mallee	69	
Murray/Kiewa/Ovens	1486	
Total Victoria	3217	36.7%
South Australia		
Metro-Adelaide & Associated Country Areas	82	
Country Towns	35	
Lower Murray Swamps	81	
All Other Uses of Water from the River Murray	413	
Total South Australia	611	7.0%
Queensland		
Condamine/Balonne	566	
Border Rivers/Macintyre Brook	197	
Moonie	31	
Warrego/Paroo	11	
Total Queensland	804	9.2%
Australian Capital Territory	28	0.3%
Total Basin	8765	100.0%

Figure 1: Murray-Darling Basin Diversions - 1983/84 to 2003/04

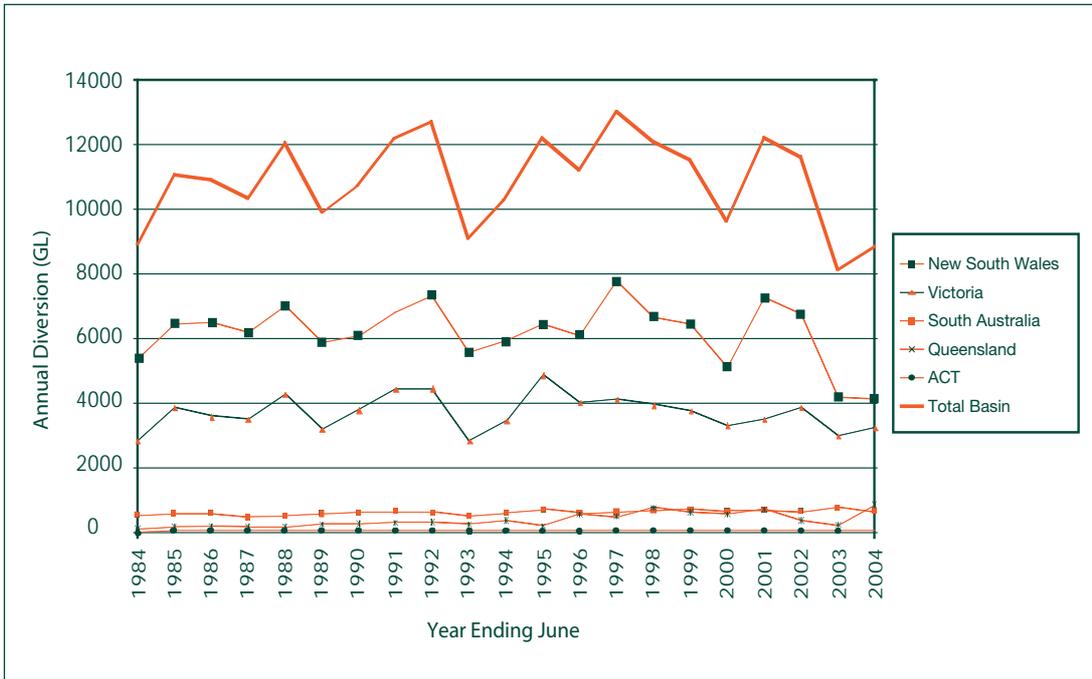


Figure 2: Murray-Darling Basin Diversions - 1983/84 to 2003/04 (usage under 1000 GL/year)



Appendix 1

Responses by the Five State and Territory Governments

The five State and Territory Governments prepared written responses to the Independent Audit Group's Report which was presented to the Murray-Darling Basin Ministerial Council in March 2005. The Council agreed to publish these responses as an appendix to the Independent Audit Group's Report.



SOUTH AUSTRALIA

The IAG confirmed that South Australian diversions for the 2003/2004 water year were within Cap for all designated valleys and that a reliable system is in place to monitor these diversions.

South Australia remains firmly committed to the implementation of the Cap and has continued the development of management tools and initiatives to facilitate the best possible reporting of compliance under the Cap.

Initiatives being pursued in South Australia include the ongoing monitoring of trends in diversions, improved metering, implementation of the **Water Information and Licensing Management Application (WILMA)** with enhanced reporting capabilities, and progression of **quality management guidelines** for data handling. The development of these strategies will continue to expand the capabilities of the South Australian government to meet its obligations into the future.

South Australia monitors diversions closely and in the event of restricted resource conditions a draft drought response policy is invoked. This was the case for the 2003/04 water-year. Reduced volumes of water held in Commission storages by May 2003 resulted in SA being advised by the Commission that there was a significant risk that the Commission could not provide South Australia with its full annual Entitlement Flow during 2003/04. In response to this advice, and near record low water levels and rising salinities in Lakes Alexandrina and Albert, the South Australian Government announced that restrictions on the taking of water from the River Murray in South Australia would be introduced for the first time.

In 2002, the Minister adopted the Water Allocation Plan for the River Murray Prescribed Watercourse (WAP) prepared by the River Murray Catchment Water Management Board. The WAP provides the legal policy framework for the management of a number of issues including long-term Cap compliance. A

significant management requirement under the WAP is irrigator annual reporting. All licence holders are required to submit an annual irrigation report as a condition of their licence and water use efficiency is now calculated and reported on a regional basis from these irrigator returns. Irrigator annual reporting is a crucial tool in natural resource management and a vital factor in irrigators becoming more aware of the direct and non-direct impacts of their water use on the environment and their own agricultural production.

A climate-adjusted model has also been finalised for the 'All Other Uses' Cap component. This was approved by the Commission in November 2004. South Australia reported, for the first time, the climate-adjusted figures for this Cap component to the IAG for the 2003/04 water-year.

Climate-adjusted models for the Country Towns and Lower Murray Swamps Caps have been considered by the South Australian Government and not deemed necessary to pursue at this stage. This does not affect the conservative application of the precautionary principle to which South Australia strongly adheres in assessing cap.

South Australia agrees with the IAG that growth in demand for metropolitan Adelaide needs to be accommodated and that any trade to metropolitan Adelaide to account for growth should be dealt with on a separate licence to maintain the integrity of the 650 GL five-year rolling average Cap. DWLBC, in conjunction with the metropolitan Adelaide licence holder, SA Water Corporation, are progressing details of this arrangement with the Commission and the IAG. Details should be finalised prior to the start of the 2005/06 water-year.

South Australia agrees with the IAG conclusions relating to each of the other States and the ACT.



VICTORIA

Victoria continued implementation of the Cap in 2003/04 through the establishment of Bulk Entitlements on regulated systems and SFMPs on unregulated streams. The Bulk Entitlement for the Wimmera-Mallee system was granted in May 2004 and the Broken and Ovens Bulk Entitlements are finalised, pending approval from the Minister. There has been continued progress on the Loddon Bulk Entitlement conversion process.

Work continued on the development of SFMPs for six key unregulated streams. Metering of diversions in all unregulated systems is an essential component of Cap implementation and metering programs are being developed to progressively meter these diversions over the next eight years.

Diversions since July 1997 from each of Victoria's four designated valleys continue to comply with the Cap. Diversions from the Murray/Kiewa/Ovens, Goulburn/Broken/Lodd and Campaspe valleys were each below their Cap targets in 2003/04. Cumulative diversions in these valleys remain in credit.

The level of diversions from the Wimmera-Mallee system has remained below Cap due to the significant water savings from the Northern Mallee Pipeline. A portion of these savings have been allocated to the environment, resulting in an environmental entitlements from savings of 34.7 GL/year at the end of the 2003/04 water year.

The climate-adjusted model covering the Goulburn/Broken/Loddon and Campaspe valleys has undergone a preliminary independent review. The model is expected to gain

accreditation in mid-2005, once modifications have been finalised. Work has continued on improvements to the Loddon component of this model, and to the modelling of Lake Mokoan following investigations into decommissioning the Lake. A decision has not yet been made on an appropriate Cap allowance for this storage. Significant work has also been undertaken on the Wimmera-Mallee model to facilitate Cap accounting, following the Bulk Entitlements conversion process.

Victoria relies on the MDBC model of the Murray system to provide Cap targets for the Murray system. This model includes a regression component to calculate Cap volumes for the Ovens and Kiewa portions of the valley. Re-calibration of the model is underway and the model is expected to gain accreditation in 2005.

Victoria will continue to provide accurate and timely water audit information as required and supports the Data Management System Protocol. Victoria will work with the MDBC and other states to implement the recommendations of the recently completed external Audit of Data Management Systems.

Victoria agrees with the IAG conclusions relating to Victoria, South Australia, New South Wales, the ACT and Queensland. Thus, Victoria supports the IAG's recommendations regarding an update of the Data Management Systems Protocol, the finalisation of the ACT and Border Rivers Caps, the provision of extra resources to allow finalisation of NSW models, and the timelines for accreditation of Cap models.





NEW SOUTH WALES

NSW remains committed to the Cap process and, in particular, to ensuring that long-term diversions are maintained within the Murray-Darling Basin Ministerial Council's Cap.

As indicated by the IAG, diversions in the combined Barwon-Darling and Lower Darling Valleys have exceeded the trigger for Special Audit. NSW accepts that this is due to diversions in the Barwon-Darling Valley. NSW has indicated that it will implement a new strategy to ensure diversions are brought back within Cap in the Barwon-Darling valley. This new strategy involves a significant change from expressing entitlements to water in the form of a maximum annual use to expressing entitlements in the form of an average annual use that accords with the long-term Cap.

The IAG has made five major recommendations, all of which impact upon NSW.

The IAG recommends that the ACT and New South Wales representatives finalise discussions on a framework for trade to enable the ACT to finalise its Cap.

NSW continues to be involved in discussions with the ACT and remains committed to a framework for trade. NSW and the ACT have commenced negotiations towards a cross-border water agreement that would include a framework for Cap and trade arrangements with the ACT. The ACT's ability to undertake permanent trade with all parts of the Murrumbidgee system, including the major Irrigation Corporations, has been an issue.

Any agreement will need to be consistent with requirements under the *National Water Initiative* and the *Living Murray Initiative*. The initiatives outline development of a range of options to facilitate trade in general, including agreement by the Irrigation Corporations to consider permanent trade of up to 4% of entitlement annually by 2005. The *National Water Initiative* requires all barriers to permanent trade be removed by 2014.

In light of the Queensland time-frame for developing its Resource Operations Plans the IAG recommends that South Australia and Victoria have all models accredited by 30 June 2005, New South Wales by June 2006 and Queensland by June 2007.

Significant efforts have been made to achieve accreditation of NSW valley models under Schedule F for Cap auditing, with the Lachlan valley being the first model in the Basin to achieve this. NSW has presented the Namoi and Macquarie valley Cap models

for accreditation during 2003/04. Whilst the Macquarie IQQM accreditation has been subsequently delayed due to issues that have become apparent during the current severe drought conditions, this represents 50% of the valleys wholly within NSW and accords well with previous IAG recommended timeframes.

The IAG recommends that additional resources be provided to enable New South Wales to finalise the models for its valleys. The Murray-Darling Basin Commission should consider making resources available as the current rate of progress is reducing the credibility of Cap implementation across the Basin.

NSW agrees that delays to production of modelling and presentation of Cap models for independent accreditation is an issue. However, external groups such as the MDBC have only a limited amount of resources that can usefully assist with the modelling and auditing process, and these resources are often assisting with these same efforts elsewhere (such as for the NSW and Victorian Murray valleys).

As indicated in this report, the extremely dry climatic conditions in recent years have produced some of the delays to the model accreditation process in some valleys. New experience in terms of climate and river system behaviour will always drive changes and improvements to modelling efforts, and this should not be seen as undermining Cap implementation. It should also be noted that improved modelling of the recent, very dry, conditions is not expected to change the long-term modelling results significantly, as these conditions are (fortunately) quite rare. The likelihood of recent model upgrades (apart from the Gwydir valley) requiring changes in management rules to ensure Cap is generally quite low.

The IAG recommends that Queensland and New South Wales finalise the Inter-Governmental Agreement and establish the framework to enable Cap targets to be established. If negotiations falter either the Murray-Darling Basin Commission or an independent facilitator should be asked to facilitate resolution of outstanding issues.

The establishment of an Inter-Government Agreement is a high priority for NSW. In the unlikely event that negotiations falter, the outstanding issues will be taken to the highest levels of Government for resolution.

The IAG supports the recommendation that an updated Data Management



NEW SOUTH WALES

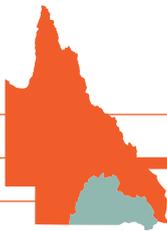
Systems Protocol be developed. The Marsden Jacobs report also raises many other issues in relation to lack of consistency within and between states in measuring, recording and reporting on diversions. As this information provides the foundation for management of water resources as well as the basis for trade, the IAG commends the Marsden Jacobs report to the Commission with a view to developing a more consistent and rigorous framework. While a 'nuts and bolts' issue it affects stakeholders' confidence in the successful implementation of the Cap across the Basin.

NSW agrees that consistency of measurement, recording and reporting of diversions between States is important, and is currently considering the recommendations made in the Marsden Jacobs report, in conjunction with the other States.

NSW should submit a monitoring report on the Intersecting Streams as required under Schedule F.

NSW agrees with this recommendation and will endeavour to provide reporting on the intersecting streams. However, NSW usage in this valley is estimated to be only 0.03% of the Basin long-term Cap, making this the smallest designated valley in the Basin in terms of water use. As the findings of this report indicate, a significant number of higher priority work is currently in progress and, as a consequence, this issue has been accorded a low priority.





QUEENSLAND

In line with Council's earlier decisions, the Queensland Cap is to be established in accordance with the provisions of Schedule F, following the completion of the Water Resource Planning processes. Compliance will be on the basis of diversions on the same principles as other States.

Queensland has now finalised Water Resource Plans in all its Murray-Darling Basin valleys, and consequently has provided a framework with a strong legislative basis, that Caps diversions from water courses, lakes, springs and overland flows. Water Resource Plans for the Border Rivers, Moonie, Nebine, Warrego and Paroo valleys were gazetted as subordinate legislation on 5 December 2003 and the final Plan for the Condamine-Balonne was gazetted on 12 August 2004. The Plans provide a consistent approach to management across the catchments, while taking the specific issues of each catchment into account.

Draft Resource Operations Plans are currently being developed to implement the provisions of the Water Resource Plans. Diversion Caps for Queensland valleys will be developed and implemented as part of the monitoring, auditing and reporting provisions of the Resource Operations Plans. Resource Operations Plans for the valleys are expected to be released progressively over the next two years.

In the Border Rivers catchment, an Intergovernmental Agreement is being developed jointly with New South Wales and in consultation with stakeholders. The respective State ministers have agreed to the Principles for the Intergovernmental Agreement and the agencies have endorsed long-term water sharing arrangements between the States. There has been considerable progress in setting event announcement rules and the principles for development of event-sharing rules for un-supplemented water along the Border stream. The Intergovernmental Agreement will be operationalised in Queensland through the Border Rivers Resource Operations Plan.

The diversions from the Queensland valleys in the Murray-Darling Basin vary considerably from year to year. This is a result of high seasonal variability and the relatively small amount of regulated schemes compared to private development based on unregulated flows. In 2003/04, more than 80% of diversions were from unregulated flows. Last year's diversions were a quarter of this year's, and this was against a background of zero growth of storage development. The provisions in the Water Resource Plans prevent construction of further works that would increase water extractions.





AUSTRALIAN CAPITAL TERRITORY

Water Use

Water use in the ACT was below average for 2003/2004 as a result of acceleration of demand management mechanisms and ongoing restrictions on urban water use which accounts for most of the ACT's water consumption. The measures implemented offset what would otherwise have been much higher consumption due to an extremely dry and hot summer. The volume of water returned through sewage treatment plants at 30GL was lower than recent years. The lower return volume is an indication of the success of domestic water conservation programs that have been implemented by the ACT Government and Queanbeyan City Council. It is likely the proportion of water returned through sewage treatment plants will continue to fall as the ACT's Water Resources Strategy, *Think Water Act Water*, is fully implemented.

Non urban consumption is again estimated at 5 GL. The reliability and the extent of non-urban consumption data are improving. It is expected data on non-urban consumption of both surface and groundwater will be of a reportable standard in the near future.

Cap

The ACT is in the process of developing a position on a Cap. It is anticipated that an ACT position will be developed during 2005. The ACT position will be based on the significantly different water management and use circumstances of the ACT. The ACT has begun discussions with NSW on a range of regional water related issues including Cap. An agreement with NSW is only one of the options being considered for the establishment of an ACT Cap.

The ACT Government continues to apply sound environmental and resource management practices including guaranteed environmental flows while it develops a position on Cap. The ACT's position will be further informed following its review of the environmental flow regime to ensure the regime meets best practice standards and most current science is incorporated. The ACT Government is committed to the implementation of an economically and environmentally sustainable Cap in the ACT.



Glossary

ACTEW	ACT Electricity and Water Corporation.
announced allocation	The per centage of water entitlement declared available for diversion from a regulated stream in a season.
annual allocation	The annual volume of water available for diversion from a regulated stream by an entitlement holder.
authorised use	Total of the water allocated in the valley plus off-allocation and water-harvesting use, plus unregulated stream use not in allocation and system losses not in allocation.
Border Rivers	The rivers and tributaries forming, or intersecting the border between NSW and Queensland.
Bulk Entitlement	A perpetual entitlement to water granted to water authorities by the Crown of Victoria under the Water Act 1989.
carryover	An unused entitlement from one season that can be used in the next year.
channel capacity	The maximum rate at which water can be delivered through a river reach or an artificial channel.
COAG	Council of Australian Governments.
diversion	The movement of water from a river system by means of pumping or gravity channels.
diversion licence	Specified licences issued for a specified annual volume and diversion rate.
DIPNR	The Department of Infrastructure, Planning and Natural Resources (of NSW).
DNR	The Department of Natural Resources (of Queensland).
DNRE	The Department of Natural Resources and Environment (of Victoria).
dozer allocation	An allocation that is not fully utilised.
DWLBC	The Department for Water, Land and Biodiversity Conservation (of South Australia).
EC (unit)	Electrical conductivity unit 1 EC = 1 micro-Siemens per centimetre measurement at 25o Celsius. Commonly used to indicate the salinity of water.
end-of-valley flows	The flow regime at the end of a valley.
floodplain harvesting	The diversion of water from a floodplain into storage(s).
FMIT	First Mildura Irrigation Trust.
gigalitre (GL)	One thousand million or 109 litres.
GL	Gigalitre: one thousand million or 109 litres.
G-MW	Goulburn-Murray Water (of Victoria).
gravity districts	Districts which use gravity to divert the flow of water from the river.



high security entitlement	An entitlement which does not vary from year to year and is expected to be available in all but the worst droughts.
IAG	Independent Audit Group.
IQQM	Integrated Quality and Quality Model.
LV	Licence Volume.
impoundment	The storage of water diverted from a watercourse.
irrigation	Supplying land or crops with water by means of streams, channels or pipes.
MDBC	Murray-Darling Basin Commission.
MDBMC	Murray-Darling Basin Ministerial Council.
megalitre (ML)	One million litres. One megalitre is approximately the volume of an Olympic swimming pool.
Ministerial Council, the	Murray-Darling Basin Ministerial Council.
ML	Megalitre: one million litres. One megalitre is approximately the volume of an Olympic swimming pool.
Murray-Darling Basin Agreement	The Agreement between the Governments of the four Basin States and the Commonwealth. The current Agreement is the 1992 Agreement.
off-allocation	When unregulated tributary inflows or spills are sufficient to supply irrigation needs and downstream obligations.
on-farm storage	Privately owned storages used to harvest surplus flows or to store unused allocations for use in the following season.
overdraw	Water diverted in one season against a prospective allocation in the subsequent year.
overland flow	Water that runs off the land following rainfall, before it enters a watercourse, and floodwater that erupts from a watercourse or lake onto a floodplain.
permanent transfer	The transfer of water entitlements on a permanent basis. The right to permanent transfers allows irrigators to make long-term adjustments to their enterprise and enables new operators to enter the industry.
private diverters	Licensed to operate privately owned pumps or diversion channels; includes river pumpers and diverters as well as town water supplies.
property right	In this context, the right to ownership of allocated volumes of water.
RAMSAR wetland	A wetland listed on the Register of internationally significant wetlands established by the Convention at Ramsar.
regulated streams/ waterways	Streams where users are supplied by releases from a storage. A water licence for a regulated stream specifies a base water entitlement defining the licence holder's share of the resources from a stream.
riparian	Of, inhabiting or situated on the bank and floodplain of a river.





RIT	Renmark Irrigation Trust.
sales water	In Victoria, water that may be purchased by an irrigator in addition to the basic water right. Access to sales water is announced each season as a per centage of Water Right depending on the available resource.
salinity	The concentration of dissolved salts in groundwater or river water usually expressed in EC units.
sleepier allocation	An allocation that does not have a history of water usage.
temporary transfer	Water entitlements transferred on an annual basis.
unregulated streams	Streams that are not controlled or regulated by releases from major storages.
utilisation	The amount of water available for diversion that is actually diverted.
water entitlement	The legal right of a user to access a specified amount of water in a given period.
water-harvesting	The diversion of water from an unregulated stream in Queensland in which the access to water is defined only by a diversion rate and a starting flow in the stream.
WAMP	Water Allocation and Management Planning. It is a process formerly under way in Queensland to enable the acceptable level of allocatable water to be determined for a river system. These plans have been superseded by Water Resource Plans.
WMRWG	Water Market Reform Working Group.
WR	Water Right.
WRP	Water Resource Plan. Plans developed in under the Queensland Water Act 2000 for allocating water between consumptive use and the environment.
WSP	Water Sharing Plan. Plans developed under the New South Wales Water Management Act, 2000 for equitable sharing and management of NSW water resources.
WUE	Water Use Efficiency.

