

Review of Cap Implementation 2006/07
Report of the Independent Audit Group



March 2008





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Independent Audit Group Members

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ACKNOWLEDGMENTS

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

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

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AUDITORS' FOREWORD

March 2008

Senator the Hon Penny Wong
Chairperson
Murray-Darling Basin Ministerial Council
MF26, First Floor
Ministerial Wing
Parliament House
Canberra ACT 2600

Dear Minister

We have pleasure in submitting to you our *Review of Cap Implementation 2006/07. Report of the Independent Audit Group.*

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

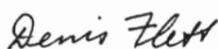
There has been further progress in the implementation of the Cap, particularly in the finalisation of the models used to assess the performance against the Cap. In this report, we have also had the opportunity to review and comment upon a proposal put forward by the ACT for a Cap for the Territory. As at October 2007, Cap arrangements have still not been finalised for some rivers in Queensland and for the Border Rivers and intersecting streams within New South Wales. However, progress is now advanced to the stage where we feel confident that Caps can be finalised for these systems within the next 12 months.

In the context of continuing severe drought conditions, it has been necessary to review and recalibrate some of the models that have been used to administer the Cap. It is expected that there will be a need for further recalibration of these models, particularly if the drought continues.

The cumulative diversions in the combined Barwon/Upper Darling and Lower Darling cap valley has dropped below the trigger for a special audit after exceeding the trigger for the last three water years.

We draw to your attention a number of specific additional issues in the report.

Yours sincerely



DENIS FLETT
Chairman



PAUL BAXTER
Member



TERRY HILLMAN
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:

At 5303 GL, diversion from rivers in the Murray-Darling Basin was the lowest in the period since 1983/84 reflecting drought conditions throughout most of the Basin. The last five years constitute five of the lowest seven years of diversion in the same period.

The 2006/07 audit identifies progress in each of the states and the ACT in establishing and/or operationalising the Cap. The key issues are:

- the submission and consideration of a Cap proposal from the ACT;
- ongoing delays in finalising a Cap for the Border Rivers and Condamine-Balonne;
- the first audit of the Moonie River and Warrego, Paroo and Nebine catchments under agreed Cap for those systems;
- the need for recalibration of models to better model extreme conditions and management responses not experienced during the period over which the models were calibrated;
- the impacts of the application of water restrictions on the calculation of Cap credits; and
- the cumulative debits for the Barwon/ Upper Darling and Lower Darling designated river valley dropping below the trigger value for a special audit.

The ACT has submitted a proposal for a Cap for the Territory (including Queanbeyan). The IAG has considered this Cap proposal against the six principles established in its 1996 *Setting The Cap Report*. The IAG considers that the ACT proposal does not meet these principles, and in particular, the Precautionary Principle. The ACT proposal envisages a population "growth" Cap which would be inconsistent with the Caps applied to other valleys which include urban towns in the Basin. The IAG has developed an alternative Cap proposal based on the same principles and practices used to set Caps for other parts of the Basin. The IAG proposal sets a climate-adjusted Cap of 40 GL on net diversions. This was calculated by factoring up the IAG's previously proposed Cap using 1991/92 *per capita* use and the population in year 2000 (rather than 1993/94 as in the previous proposal). This is consistent with previous IAG determinations for

Caps in relation to urban water supplies. Provision has also been made for Commonwealth Government diversions from Lake Burley Griffin and for the future crediting of 2 GL in water savings within the ACT as part of *The Living Murray program*. The ACT would be able to accumulate Cap credit and preliminary estimates suggest that these credits would currently be approximately the same as the "long-term Cap" that the ACT argues they have a right to under legislation establishing the Territory as the "Seat of Government".

An interim Inter-Governmental Agreement that deals with interstate water sharing and access arrangements for the Border Rivers catchment has been negotiated between Queensland and New South Wales. The provisions in the interim Inter-Governmental Agreement will be reflected in Queensland's Resource Operations Plan and the New South Wales Water Sharing Plan. The NSW *Border Rivers Regulated River Water Sharing Plan* and the Queensland *Border Rivers Resource Operations Plan* are progressing. Cap proposals are expected to be submitted to the MDBC by mid 2008 with accounting against these Caps to commence for the 2007/08 year.

The Resource Operations Plan for the Condamine-Balonne was released in draft form in April 2007 with finalisation expected by early 2008. Queensland has committed to submitting a Cap proposal no later than six months from the completion of the Resource Operations Plan.

The Resource Operations Plan for the Moonie, Warrego, Nebine and Paroo were gazetted in January 2006 and Cap proposals were submitted to the Commission in November 2006. These were audited by the IAG in February 2007, and accepted by the Commission. The first annual audit against these Caps is for the 2006/07 year.

Progress has been made on the finalisation and submitting of models for independent assessment and accreditation.

The IAG recognises that models may need to be recalibrated if conditions are experienced that are outside those that occurred during the period over which the model was originally calibrated.

The IAG has confidence in the models but recognises that the need to recalibrate the models raises some concern about the reliability of the models that are used to measure performance against the Cap.

In considering the current administrative arrangements for Schedule F accounting, the IAG has been conscious of the impact that restrictions on water may have on the generation of Cap credits. It is evident that Cap credits can grow on an annual basis simply because water restrictions have been applied in response to the drought. For some of the models used, allowance has been made for water restrictions in the determination of annual diversion targets.

The IAG recommends that to ensure consistency, all Cap models used to calculate annual diversion targets as required by Schedule F, should incorporate mechanisms to account for water restrictions.

In its 2005/06 Annual Cap Report, the IAG made three general recommendations on the operation of the Cap. Action taken in response to these recommendations is noted briefly below:

- *need to have all models completed, audited and accredited;*
 - progress has been made during 2006/07 and the outstanding valleys yet to be submitted for model accreditation have been reduced to the Barwon-Darling, the Border Rivers, the Condamine-Balonne and the ACT,
- *shortages in skilled staff and resources;*
 - while there is some evidence of gains, this problem has been further exacerbated by institutional uncertainty and the expansion of activity on water reform across the nation in part in response to the worsening drought situation,
- *the Commission expedite the development of strategies to address integrated water cycle management in the Basin including the management of farm dams, and plantation use of groundwater.*
 - the *Risks to Shared Water Resources Program* is endeavouring to address these matters.

The conclusions and recommendations reached by the IAG for 2006/07 by State and Territory are:

South Australia

- Diversions in 2006/07 were 628 GL compared to diversions of 590 GL in 2005/06.
- Diversions in 2006/07 were constrained as a result of restrictions due to ongoing drought conditions and were within the annual Cap targets for Metropolitan Adelaide, Country Towns and *All Other Purposes* Cap valleys.
- Diversions for the Lower Murray Swamps Cap valley are currently not fully metered and are assumed to equal the Cap. In 2006/07, the Lower Murray Swamps were subject to 60% allocations and diversions were assumed to equal 60% of the Cap. Full metering is expected to be completed in 2007/08.
- South Australia has a reliable measuring system for urban and irrigation use.
- The South Australian *All Other Purposes* Cap model was approved by the Commission in November 2004.
- **The IAG recommends that South Australia develop a model of diversions from the River Murray for Metro-Adelaide. This model should simulate urban demand, inflows from the local Adelaide Hills Catchments and the operation of the supply system. It should be used to generate annual Cap targets, and make allowances for water restrictions which would otherwise result in the artificial growth in Cap credits. The model should be accredited by June 2009.**
- In the interim South Australia continues to provide a sufficient allocation to the "First Use Licence" to cover estimates of growth.
- Although work on this matter has been delayed by commitment to the drought program, South Australia still proposes to amalgamate remaining Lower Murray Swamps Cap components with the *All Other Purposes* Cap while retaining the Environmental Land Management Allocation as a non-tradable component within the *All Other Purposes* Cap. This is supported by the IAG as it has no impact on the Cap volume within South Australia and is administratively more convenient.
- **The IAG recommends that an allowance be included in the calculation of the annual diversion targets for Metro Adelaide, Country Towns, the Lower Murray Swamps and the *All Other Purposes* licence for the imposition of water restrictions. Desirably this adjustment should be incorporated in the models which**

calculate the Cap targets since this would be consistent with the practice used in the other States. However, to ensure equity between the restriction-adjusted Cap estimates prepared for valleys in other States and those applying in South Australia, the IAG recommends that an adjustment be made in 2006/07 by multiplying the annual diversion target by the final announced allocation of 60%.

Victoria

- Diversions in 2006/07 were 2206 GL compared to diversions of 3222 GL in 2005/06;
- Diversions for the Campaspe and Wimmera-Mallee in 2006/07 were below annual climate and trade-adjusted Cap targets;
- However, diversions for the Murray/Kiewa/Ovens valley and the Goulburn/Broken/Loddon valley were slightly above the annual Cap targets for the year;
- Cumulative diversions since 1997 for all valleys are in credit and are still well short of exceeding the trigger for a special audit;
- The Murray model has been recalibrated and is undergoing review prior to accreditation;
- Some discrepancies have been noted in the performance of the Campaspe model, and this will possibly be subjected to a further recalibration to take into account the current unprecedented drought conditions;
- Bulk water entitlements have been finalised for major valleys;
- Significant changes for Cap management and implementation will continue as a result of changes agreed to as part of the *National Water Initiative*, the *Living Murray* project and other specific Victorian Government projects (for example the *Food Bowl Modernisation Project*) particularly in relation to provision for water for the environment resulting from water saving projects and other initiatives.

New South Wales

- Diversions in 2006/07 were 2304 GL compared to 5038 GL in 2005/06;
- Cap models have been approved for three NSW valleys and been submitted for accreditation for another five valleys. Only the models for the Barwon-Darling and Border Rivers are outstanding;
- Further recalibration of some models may be required to cover the recent extreme conditions that were not experienced in the period over which the models were calibrated;
- **The IAG recommends that NSW should submit its “current conditions” modelling to independent audit;**
- **The IAG recommends that the Mulwala Loss Allowance should not be subtracted from the NSW Murray Cap Diversion under the current rule. As noted in the 2005/06 IAG Report, should the Council choose to change the rule by amending the *Register of Diversion Definitions* in future to allow the Mulwala Loss Allowance subtraction, the IAG recommends that the Council should give prior consideration to the consequences of the decision on the integrity of the Cap;**
- The preliminary Schedule F accounting for the 1997/98 – 2006/07 period indicates that diversions in the combined Barwon/Upper Darling and Lower Darling Cap valley are cumulatively 57 GL above Cap, but below the combined trigger for special auditing of 62 GL;
- **The IAG therefore recommends that the Commission revoke its declaration that the combined Barwon/Upper Darling and Lower Darling valley is in breach of the Cap;**
- However, the IAG is concerned that following the completion of the current work to include a restriction policy in the Lower Darling Cap model, it may subsequently be found that the combined Barwon/Upper Darling and Lower Darling remains in breach of the Cap
- 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 has previously expressed concern that the Border Rivers will be found to be in breach once a Cap is defined. Finalisation of a Cap together with agreed Water Sharing Plans are expected by mid 2008 with the final agreement to an Inter-Governmental Agreement between NSW and Queensland expected to occur by the end of 2007;

- 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;
- Accumulated diversions have been below the Schedule F trigger levels for other valleys in NSW.

Queensland

- Diversions in 2006/07 are estimated at 140 GL, the lowest since 1993/94;
- Cap figures for Queensland Murray-Darling Basin valleys have now been set for the Warrego, Paroo, Nebine Catchments and the Moonie River, and these systems have all been found to be within Cap;
- Resource Operations Plan for the Border Rivers and the Condamine Balonne system are expected to be finalised by late 2007 and early 2008 respectively and Queensland will submit the Cap proposals within six months of the finalisation of these plans;
- Queensland has agreed that the associated models will be submitted for technical audit and subsequent accreditation by the Murray-Darling Basin Commission upon finalisation of the Resource Operations Plan;
- An interim Inter-Governmental Agreement that deals with interstate water sharing and access arrangements for the Border Rivers catchment has been negotiated between Queensland and New South Wales;
- Queensland has committed to submit Cap proposals to the Murray-Darling Basin Commission within six months of finalisation of the Resource Operations Plan.
- There is also an expectation by the Murray-Darling Basin Ministerial Council that Queensland will place a proposal for Cap figures for each valley before Council before finalising the statutory process.

Australian Capital Territory

- The ACT has reaffirmed its commitment to establishing a Cap;
- A proposal from the ACT for a Cap linked to growth in population, and arguing retention of certain rights under legislation establishing the Territory as the seat of government, has been reviewed by the IAG but found not to meet the principles applied in setting the Cap for other parts of the Basin;
- **The IAG recommends an alternative Cap proposal which provides for a 40 GL climate-adjusted Cap based on net diversions, and allowing for the retention of credits that would have been generated over the last 10 years had a Cap of this size been adopted at that time;**
- Net diversions of 25 GL in 2006/07 are consistent with the average net diversion between 1989 and 2006 of 31 GL and are also less than a possible climate-adjusted annual Cap target of 51.2 GL. The ACT would have a cumulative credit of 107 GL if the Cap of 40 GL proposed by the IAG had applied since July 1997, although this may be reduced once allowance is made in the model for restrictions under dry conditions so that the model is consistent with those in other jurisdictions.

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 a role in auditing the implementation of the Cap.

In March 2005, the Commission agreed to continue the role of the IAG in auditing Cap compliance until 2009.

In October 2005, the two person IAG comprising Dr Wally Cox and Paul Baxter was expanded to three members, with the addition of Denis Flett. This reflected the decision by Council to require the IAG to also undertake the audit of The Living Murray initiative and the need for succession planning. *The Living Murray* audit is set out in a separate report *Review of The Living Murray – Implementation Audit 2006/07*.

In August 2007, the Council requested that the IAG undertake an annual review of how the activities and processes that pose a risk to the shared water resources of the Murray-Darling Basin (the "risk factors") are taken into account in water management arrangements for each valley and the Basin. For the 2006/07 review, the IAG is to review the risk matrices that have been prepared by individual jurisdictions as part of their initial assessment of these risks. The report of the IAG is provided in a separate report, *Review of Risks to the Shared Water Resources - IAG Review 2006/07*.

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 between consumptive and in-stream use in Queensland. The Council has supported the auditing

of both the process and outcomes.

The *Review of Cap Implementation 2006/07* 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's Condamine/Balonne and Border Rivers within both Queensland and New South Wales are still to be established, although in this year's report, the IAG discusses a proposal from the ACT Government for a Cap for the Territory.

In October 2007, Dr Wally Cox resigned from the IAG. The 2006/07 Audit was conducted with assistance provided to the IAG by Terry Hillman. Members of the IAG wish to acknowledge the significant contribution that Wally Cox has made to the success of the IAG in its independent audit role which now encompasses not only the Cap on surface water diversions from the Basin, but also reviews of the *Living Murray* initiative and the *Risks to Shared (Basin) Water Resources* project.

The IAG team also 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 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 continue to be 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:

- 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 should 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.

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 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 IAG previously advised its view that, subject to independent assessment by the IAG and advice to the Council, 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.

Following the Inter-Governmental Agreement to establish *The Living Murray* initiative, the IAG with an expanded membership was asked to undertake both audits. The Living Murray initiative will lead to modifications in setting and modifying Cap targets to reflect water saved and/or purchased for environmental use. The inclusion from 2007 of a requirement on the IAG to review jurisdictional responses to the *Risks to Shared Water Resources* project, further extends the role of the IAG and brings greater focus to the operational rules and procedures used in the day to day management of the river system, and the role this plays in ensuring future availability and security of water for consumptive and environmental use.

The 2005/06 Review of Cap Implementation identified that:

- At 9116 GL, diversion from rivers in the Murray-Darling Basin was the sixth lowest in the period since 1983/84 reflecting continuing drought conditions throughout most of the Basin;
- Caps were still to be established for valleys in Queensland, the Border Rivers in New South Wales, and the ACT;
- Only three models had been accredited to date although a further four have been submitted for accreditation. The NSW and Victorian Murray, the Murrumbidgee and Lower Darling models are expected to be ready for auditing by December 2006. Modified targets of July 2007 are proposed for the remaining Victoria and New South Wales and, on completion of the Resource Operations Plan, for Queensland and for establishing of a Cap for the ACT;
- In South Australia, diversions in 2005/06 were constrained as a result of restrictions early in the season and were within the annual Cap targets for Metropolitan Adelaide, Country Towns and *All Other Purposes* Cap valleys;
- In Victoria diversions for the Murray/Kiewa/Ovens Valley, and Campaspe were all below annual climate and trade-adjusted Cap triggers. For the Goulburn/Broken/Loddon valley, diversions were slightly above Cap but well below the trigger;
- In New South Wales diversions were 4987 GL compared to 3670 GL in 2004/05;

- The preliminary Schedule F accounting for the 1997/98 – 2005/06 period indicates that diversions in the combined Barwon-Darling/Lower Darling Valleys are cumulatively 143 GL above Cap, and above the combined trigger for Special Auditing of 62 GL. Therefore a Special Audit is required for this valley although the IAG notes that the combined Barwon-Darling/Lower Darling Valleys has already been declared to be in breach of the Cap and the NSW authorities, in acknowledging the breach, advise that they have no additional information beyond that already provided to the IAG that would be relevant to a further Special Audit at this time;
- Diversions have been below Cap levels for other valleys in NSW;
- Queensland diversions are estimated at 305 GL;
- In the ACT net diversions of 32 GL in 2005/06 are consistent with the average usage between 1989 and 2001 of 31 GL. The ACT would have a cumulative credit of 62.8 GL if the Cap of 38 GL notionally used proposed by the IAG had applied since July 1997.

3. AUDIT PROCESS

For the purposes of this 2006/07 audit of progress with the implementation of the Cap, the IAG has adopted a consultative approach, where relevant, designed to:

- clarify expected Cap outcomes where relevant for each State;
- gather available statistical information on actual levels of diversions in 2006/07 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, the Commonwealth and the ACT during the period 22 to 25 October 2007. In relation to the Cap, the format of each meeting was to compare water usage in 2006/07 with Cap targets, to discuss progress with the establishment of models and management frameworks to achieve targets and to discuss issues of possible concern.

For the southern Murray-Darling Basin States (New South Wales, Victoria, South Australia), the ACT and Commonwealth, the IAG also discussed progress in implementing the *Living Murray* initiative. The results of these discussions are reported separately in the *Review of The Living Murray – Implementation Audit 2006/07*. For all States, the Commonwealth and the ACT, the IAG also discussed matters arising out of the first self assessment of the *Risks to Shared Water Resources* project. The results of these discussions are reported separately in *Review of Risks to the Shared Water Resources – 2006/07*.

The IAG drafted its observations and conclusions on progress being made 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, the Commonwealth, and the members of the MDBC staff, the findings and conclusions presented in this report are entirely those of the IAG.

4. AUDIT OF 2006/07 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 fully 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 trade¹;
 - 72 GL per year for swamp use with unrestricted trade;
 - 22.2 GL per year non-tradeable Environmental Land Management Allocation (ELMA); and
- an average of 440.6 GL per year for *All Other Purposes* in South Australia which is fully tradeable.

4.1.2 2006/07 Usage

Restrictions on River Murray water use were applied again in the 2006/07 water year which was the fourth consecutive year where allocations from 1 July were restricted. The South Australian River Murray Drought Water Allocation Policy was implemented again and will be reviewed as a result of drought conditions experienced in 2006/07.

River Murray flows to South Australia were severely constrained during 2006/07 as a result of ongoing drought conditions. South Australia was entitled to a flow of 1500 GL for the year and only 1470 GL was delivered, allowing a total of 30 GL to be carried over for delivery in 2007/08. This was the third lowest flow that South Australia received in recorded history.

An allocation of 80% for River Murray irrigators was announced on 1 July 2006 with the failure of winter and spring rainfall the distributable resources available to South Australia declined and a reduction to allocations to 60% was announced in October 2006.

This was the first time that an allocation reduction had occurred in South Australia. The environment continues to suffer significant ecological stress and decline due to the ongoing impact of low flows across the border.

South Australian diversions from the River Murray were 628 GL including the additional 60 GL pumped as a water security measure. The Senior Officials Group recommended the pumping of this additional 60 GL to First Ministers involved in water security contingency planning for the southern Murray-Darling Basin. If this additional volume was not pumped, the final diversion figure would have been 568 GL, being the lowest diversion since the Cap was implemented.

The Metropolitan Adelaide allocation was initially restricted to 143 GL and was increased to 203 GL later in the year to include the additional 60 GL. The diversion of 628 GL was higher than the previous year but substantially lower than 2002/03 when 736 GL was diverted. The high diversions combined with the low flows across the border and minimal local rainfall caused significant access issues for irrigators below Lock 1, particularly those water users around Lakes Alexandrina and Albert. Local weather conditions significantly influence the pattern of water use within South Australia. (Table 1).

1 The 9.3 GL per year for Highlands accounted for under the Lower Murray Swamps is now accounted under the *All Other Purposes* Cap. This component was transferred as part of the Lower Murray Swamps rehabilitation.

Table 1: South Australian Diversions for 2006/07 (GL)

System	Original Long-term Average Cap Diversion	Climate-Adjusted Annual Cap Target	Adjustment to Target due to Net Permanent Trade	Adjustment to Target due to Net Temporary Trade	Adjusted Cap Target for 2006/07	Diversion for 2006/07	Diversion for last Five Years	Cap Credits (Cap Target less Diversion)		
								2006/07	Cumulative since 1997/98	Schedule F Trigger
Metropolitan Adelaide										
First Use Licence (1, 2)	0	0	0	0	0	0	44.8	0	0	0
Remainder	650	-	-	-	-	203.1	550.6	99.4	-	-
Total	-	-	-	-	-	203.1	595.4	-	-	-
Country Towns	50	50	0	10.7	60.7	40.7		20.0	89.9	0
Lower Murray Swamps	103.5	103.5	-44.7 ³	-7.1	51.7	28.2		23.5	28.4	0
All Other Purposes	440.6	475.6	77.7	36.5	589.8	355.9		233.9	684.7	0
TOTAL	-	-	33.0	40.1	-	627.9		-	-	-

1. This is temporary transfer against a First Use Metro Adelaide Licence held in *All Other Purposes* Cap valley
2. The diversion includes the volume of temporary transfer described in 1
3. This includes 9.3 GL of highland usage which was transferred to the *All Other Purposes* Cap.

South Australia continues to be well placed to manage diversions within their respective Caps. The majority of water diverted from the River Murray is metered and only a small portion of the recorded diversion was not metered (23 GL). All diversions remained within the annual Cap targets and all valleys remain in cumulative Cap credit.

4.1.3 Administration of the Cap

South Australia continues to be well placed to manage the Cap. Water diverted from the River Murray 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.

Any growth in River Murray extractions from growth in demand has, pending the development of an appropriate model to account for growth, been covered by the transfer of entitlement into a Metropolitan Adelaide "First Use Licence" which is debited against *All Other Purposes* (Table 2).

The gazetted use of water for Metropolitan Adelaide was originally 143 GL but increased to 203 GL to accommodate the additional 60 GL pumped into the Mount Lofty Ranges for water quality purposes.

The five-year rolling total (excluding the "First Use Licence") water is 550.6 GL leaving a remaining Cap credit of 99.4 GL. This rolling total includes the additional 60 GL pumped during 2006/07 for delivery in 2007/08.

Table 2: Metropolitan Adelaide Cap Assessment

	2002/03	2003/04	2004/05	2005/06	2006/07	Total
Gross Diversion	164.7	82.1	71.6	73.9	203.1	595.4
First Use Licence	11.0	9.4	8.4	16.0	0.0	44.8
Rolling Diversion Against 650 GL Cap	153.7	72.7	63.2	57.9	203.1	550.6
Five Year Cap						650.0
Credit						99.4

The ability to temporarily trade water into the "First Use Licence" and use this to offset growth in Metro Adelaide water usage has been agreed on an interim basis by the IAG until a new Cap management arrangement is agreed by the Ministerial Council. In the longer-term, the IAG considers that water should be traded permanently into this "First Use Licence" based on the estimate in the growth in demand by Metro Adelaide.

The issue of Quality Assurance is being addressed. Licensing and diversion data has 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 in use since 1 July 2004 and is being upgraded to handle interstate water trade. Compliance and enforcement initiatives were increased in 2006/07 because of the severe restrictions on water users.

A Cap model for calculating the climate-adjusted annual Cap target for SA's *All Other Purposes* (commonly called Highland irrigation) has been developed. Following recommendation from the Independent Auditor of Cap models, this model was 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.

There was a further 2 GL of permanent trade from the swamps to Highlands this year. This is in addition to the 33.7 GL that had been traded out permanently in previous years and the 9.3 GL Highland component of the Lower Murray Swamps which is now recorded as *All Other Purposes* diversions. A further 7.1 GL, (60% of 11.8 GL) was traded temporarily from the swamps in 2006/07. This left an allocation of 47 GL in the swamps, and usage was restricted to 60% of this quantity.

There was net permanent trade in 2006/07 of 13.8 GL into South Australia's *All Other Purposes* Cap valley from interstate. In total 37 GL has been permanently traded into South Australia since 1998 and this has increased the *All Other Purposes* Cap by 33 GL. In 2006/07 there was a net temporary trade into South Australia of 40.1 GL. This was a turnaround in temporary trade, from 24.3 GL out of the State the previous year, to 40.1 GL into the State this year.

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 for irrigation, i.e. Barossa Valley and 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.

4.1.4 Monitoring and Reporting

SA has implemented a modified computer based system for licensing and monitoring of water use (WILMA) which provides the basis for reporting water allocation and use.

Urban consumption (Metropolitan Adelaide and Country Towns) and irrigation consumption in the Highland *All Other Purposes* rehabilitated irrigation areas are reliably metered (97% metered). Complete rehabilitation was achieved in the Highland region during the 2004/05 water year. 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 almost complete and should provide data for the 2007/08 report.

4.1.5 Proposals to Refine Implementation in 2007/08

South Australia will continue to improve its capacity to manage Cap targets and implement measures to reduce the reliance on the River Murray. This will be achieved through a number of initiatives including *Waterproofing Adelaide*, recycling of treated wastewater and further development of conservation measures for industry and households.

Full metering of the Lower Murray Swamps is nearly complete and works continue to enable the reuse of drainage water within the Lower Murray Swamps. The drought has impacted on the full implementation of rehabilitation and metering program.

Due to the significant level of departmental commitment being diverted to drought programs, the proposal in last year's IAG report to amalgamate the Lower Murray Swamp and *All Other Purposes* Cap has been postponed. The 22.2 GL Environmental Land Management Allocation will remain as a non-tradeable environmental entitlement under a revised Cap, which may also include Country Towns. It is expected that work will commence on the amalgamation sometime in 2008.

Work will continue on the review of the Metropolitan Adelaide and Associated Country Areas Cap to account for any growth. The IAG is of the view that South Australia has applied the Precautionary Principle in providing a "First Use Licence" to accommodate possible growth and work will continue on the development of a growth model. Delays may occur with this if drought conditions persist because of the shortage of suitably skilled staff to undertake the project.

4.1.6 IAG Assessment

Consumption in South Australia in 2006/07 was significantly constrained and in an unprecedented move, allocations were reduced from those originally announced during the year. Diversions for Country Towns, Metropolitan Adelaide and *All Other Purposes* were below Cap. Diversions for the Lower Murray Swamps are not currently fully metered and assumed to equal the Cap.

Metropolitan Adelaide consumption over the last five years was 595.4 GL compared with the target of 650 GL. Compliance with this Cap has been further enhanced by the transfer over the last five years of 44.8 GL from *All Other Purposes* designated valleys and Country Towns under a proposed 'First Use Licence'.

The decision by the SA authorities to apply a 60% allocations restriction in 2006/07 highlights a potential emerging problem with the modelling that has been used in South Australia. Currently the modelling assumes a full allocation of the Cap, whereas the application of restrictions on allocations effectively ensures that there is a growing Cap credit against each of the licensed allocations. While this does

not present a problem during a period of continuing drought, once the drought breaks SA could be holding significant Cap credits when in fact these credits represent an artificial constraint on usage during the period of drought ration rather than the climate-adjusted modelled outcome.

With the exception of the modelling for the Lower Darling, other States have included in their modelling an allowance for water restrictions. There is a need to make similar adjustments to the modelling for *All Other Purposes*, and the Cap for Country Towns and Lower Murray Swamps. This would better reflect the impact of water restrictions on the effective size of the Cap during periods of extended water shortages, and would remove the artificial growth in Cap credits that otherwise occurs. A similar adjustment should also be made to the Metro Adelaide Cap.

An interim method for allowing for the restriction would be to factor down the annual diversion target by the final announced allocation percentage. It would also be necessary to factor down the trade adjustment caused by the permanent transfer of water from the swamps to the *All Other Purposes* Cap. The application of this adjustment and its impact on South Australian Cap credits is shown in **Tables 3 and 4**.

Table 3: Method Proposed by IAG for Reducing SA Caps in Years of Restriction

CURRENT METHOD						
Cap Valley	Annual Diversion Target from Cap Model (GL)	Adjustment to Cap for Trade (GL)	Adjusted Cap 2006/07 (GL)	Diversion 2006/07 (GL)	Cap Credits for 2006/07 (GL)	Cumulative Cap Credits since 1997/98 (GL)
Country Towns	50	10.7	60.7	40.7	20.0	89.9
Lower Murray Swamps	103.5	-51.8	51.7	28.2	23.5	28.4
All Other Purposes	475.6	114.2	589.8	355.9	233.9	684.7
PROPOSED METHOD – RESTRICT CAP BY THE ANNOUNCED RESTRICTION						
Cap Valley	Annual Diversion Target from Cap Model Reduced by the 60% Allocation (GL)	Adjustment to Cap for Trade (GL) (Permanent trade adjustment from swamps to AOP also reduced)	Adjusted Cap 2006/07 (GL)	Diversion 2006/07 (GL)	Cap Credits for 2006/07 (GL)	Cumulative Cap Credits since 1997/98 (GL)
Country Towns	30	10.7	40.7	40.7	0.0	67.4
Lower Murray Swamps	62.1	-33.9	28.2	28.2	0.0	0.0
All Other Purposes	285.4	96.3	381.7	355.9	25.7	452.9

Table 4: Method Proposed by IAG for Reducing Metro-Adelaide Cap in Years of Restriction

CURRENT METHOD						
	2002/03	2003/04	2004/05	2005/06	2006/07	Total
Five Year Cap	130	130	130	130	130	650
Rolling Diversion Against 650 GL Cap	153.7	72.7	63.2	57.9	203.1	550.6
Credit						99.4
PROPOSED METHOD – RESTRICT CAP BY THE ANNOUNCED RESTRICTION						
	2002/03	2003/04	2004/05	2005/06	2006/07	Total
Five Year Cap	123.5	130	130	130	78	591.5
Rolling Diversion Against 650 GL Cap	153.7	72.7	63.2	57.9	203.1	550.6
Credit						40.9

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 being implemented 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 2006/07 were 628 GL compared to diversions of 590 GL in 2005/06;
- Diversions in 2006/07 were constrained as a result of restrictions due to ongoing drought conditions and were within the annual Cap targets for Metropolitan Adelaide, Country Towns and *All Other Purposes* Cap valleys;
- Diversions for the Lower Murray Swamps Cap valley are currently not fully metered and are assumed to equal the Cap. In 2006/07, the Lower Murray Swamps were subject to 60% allocations and diversions were assumed to equal 60% of the Cap. Full metering is expected to be completed in 2007/08;
- South Australia has a reliable measuring system for urban and irrigation use;
- The South Australian *All Other Purposes* Cap model was approved by the Commission in November 2004;
- The IAG recommends that South Australia develop a model of diversions from the River Murray for Metro-Adelaide. This model should simulate urban demand, inflows from the local Adelaide Hills Catchments and the operation of the supply system. It should be used to generate annual Cap targets, and make allowances for water restrictions which would otherwise result in the artificial growth in Cap credits. The model should be accredited by June 2009;
- In the interim South Australia continues to provide a sufficient allocation to the “First Use Licence” to cover estimates of growth;
- Although work on this matter has been delayed by commitment to the drought program, South Australia still proposes to amalgamate remaining Lower Murray Swamps Cap components with the *All Other Purposes* Cap while retaining the Environmental Land Management Allocation as a non-tradable component within the *All Other Purposes* Cap. This is supported by the IAG as it has no impact on the Cap volume within South Australia and is administratively more convenient;
- The IAG recommends that an allowance be included in the calculation of the annual diversion targets for Metro Adelaide, Country Towns, the Lower Murray Swamps and the *All Other Purposes* licence for the imposition of water restrictions. Desirably this adjustment should be incorporated in the models which calculate the Cap targets since this would be consistent with the practice used in the other States. However, to ensure equity between the restriction-adjusted Cap estimates prepared for valleys in other States and those applying in South Australia, the IAG recommends that an adjustment be made in 2006/07 by multiplying the annual diversion target by the final announced allocation of 60%.

4.2 Victoria

4.2.1 Status of Models used to Calculate Annual Cap Targets

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.

The model for Goulburn/Broken/Loddon and Campaspe valleys was accredited by the Murray-Darling Basin Commission Meeting 93 — 4 September 2007. This model has been used to calculate the 2006/07 Cap targets and the cumulative credits for these valleys presented in this report.

MDBC has developed a simulation model for the Murray and regression relationships with rainfall and temperature for the Kiewa and Ovens components of the Murray/Kiewa/Ovens valley Cap. Documentation of model assumptions, final model and calibration results for these three models have been submitted to the model auditor for accreditation of the models. These interim models have been used to calculate the 2006/07 Cap target and the cumulative credits since 1997.

Grampians Wimmera Mallee Water (GWMW) is making arrangements to develop an appropriate Cap model for the Wimmera-Mallee system.

As a result of revised estimates of model input data for May and June 2006, the 2005/06 Cap targets for Goulburn/Broken/Loddon and Campaspe valleys have changed slightly (less than 0.5% of the long-term Cap) compared to figures reported in last year's report. Due to re-calibration of the Murray model, the Cap targets for Murray/Kiewa/Ovens valley back to 1997/98 are different from the figures reported last year. This revision caused the cumulative Cap credit to reduce by 308 GL. However, diversions from the Murray/Kiewa/Ovens valley are still well below the revised Cap.

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

4.2.2 2006/07 Diversions

Overview

Irrigation areas supplied from the Murray, Goulburn, Broken, Loddon and Campaspe systems all experienced record low water availability during 2006/07 due to very low carryover storage volumes and extremely low inflows.

There was no allocation at all for the Campaspe, Loddon and Bullarook Creek (Hepburns) systems. On the Goulburn System, no water was available for irrigation at the start of July 2006. By mid-August 2006,

the allocation had increased to 7% of Water Right. Opening allocations for the Murray and Broken systems were 76% and 37% of water right/licensed volume respectively. On the Bullarook Creek system supplied from Newlyn Reservoir, the opening allocation was 22% of licensed volume for customers. No Sales were available on any of these supply systems.

The Minister for Water, as was the case for the previous three years, qualified rights to water for a number of systems early in the year to enable essential supplies to continue until conditions improved. In most cases these qualification of rights applied all year.

As resources improved, seasonal allocations progressively increased on all systems. On the Broken system, the final allocation of 77% of licensed volume was not reached until the start of April 2007. The allocation on the Goulburn System reached 29% of water right/licensed volume in mid-April 2007. By mid-October 2006, the Murray allocation had reached 95% of water right after which no further increases in allocation were made.

A few irrigation areas received above average rainfall during late winter but upper catchment areas did not fair as well. Spring was extremely dry and summer rainfall was below average in most areas with a few exceptions including Kerang and Swan Hill. The autumn was much wetter with a number of areas recording above average rainfall but early winter was dry in all areas.

Major storages on the Goulburn, Campaspe, Loddon, Broken, Ovens, King and Murray systems all failed to fill to capacity. Pumps were installed to access dead storage in Lake Buffalo and at Waranga Basin to increase water availability. This was the second time since 2003 that pumps have been used at Waranga Basin. At Tullaroop reservoir, pumps were used to maintain a small flow in Tullaroop Creek.

Inflows to the Campaspe and Loddon systems at 1 to 2% of average were the lowest on record. Eildon, Hume and Dartmouth storages had annual inflows 21%, 8% and 33% of average respectively. These inflows were significantly less than those recorded in 2005/06. All storages in major irrigation systems were drawn down to very low levels by the end of April. Lake Hume was drawn down to 2.5% of capacity in mid-February 2007 which was its lowest level since the construction of Dartmouth Dam.

Diversions from the Murray/Kiewa/Ovens and Goulburn/Broken/Loddon valleys were above their Cap targets for 2006/07 and those from the Campaspe valley were below the Cap target for 2006/07. Although 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 from these new entitlements were made in 2006/07 ensuring that diversions in the Wimmera-Mallee valley remain below 1993/94 levels.

All four Victorian valleys have cumulative Cap credits up to 30 June 2007. A comparison of cumulative diversions with Cap targets is shown in **Table 5**. These values are preliminary, as trade data needs to be reconciled with other valleys and checking of final accuracy is yet to be undertaken.

It should be noted that, due to model re-calibration of the Murray model, Cap targets (and therefore Cap credits) back to 1997/98 for the Murray/Kiewa/Ovens valley are 308 GL lower than the figures reported in last year's report.

Goulburn/Broken/Loddon

Resource availability

Annual rainfall at Eildon during 2006/07 was 58% of average and the annual inflow to Lake Eildon was only 21% of average. The cumulative inflow to Lake Eildon from October 1996 to the end of June 2007 has been the lowest on record for this 128 month sequence. After peaking at 23% of capacity in mid-August 2006, Lake Eildon was drawn down to 5.3% of capacity by late April 2007.

The unregulated inflow between Eildon and Goulburn Weir for 2006/07 was only 7% of average. The diversion efficiency at Goulburn Weir for the year was 100% since there were no unregulated flows passing the weir for the entire year.

Due to high demand for temporary trade from the Murray back into the Goulburn, only 2 GL of Goulburn Inter Valley Trade (IVT) water was transferred to the River Murray. This was supplied via the lower Campaspe River to provide additional environmental

flow. There was also 1.45 GL of Lake Mokoan Snowy water transferred to the River Murray.

The initial 2006/07 allocation on the Goulburn system was zero but it increased to 7% by 15 August 2006 and then to a final allocation of 29% of water right by 15 April 2007. No sales allocation was announced for the ninth consecutive year in a row.

Lake Nillahcootie annual inflow for 2006/07 was 2% of average and the storage reached a maximum of 58% in early July 2006. In mid July 2006, Lake Mokoan reached 30% of capacity and was drawn down to 4.5% by early May 2007. Releases from Lake Mokoan continued for most of the year and the total release was 29.8 GL. None of this was used to supplement supplies to diverters on the lower Goulburn River. The opening allocation on the Broken system was 37% of licence volume increasing to a final allocation of 77% by mid April 2007.

Very low carryover volumes combined with inflows well below average resulted in the Cairn Curran and Tullaroop reservoirs both reaching only 5.7% and 15% of capacities. Storages at the end of the year were the lowest on record. Water was made available for essential needs in the Loddon system but there was no allocation for irrigation and no supplement to the Boort Irrigation Area.

Cap compliance

Diversion from the Goulburn/Broken/Loddon valley was 715 GL, which is 73 GL above the Cap target of 642 GL (with preliminary adjustment for trade). Diversions were 65% below the long-term Cap of 2034 GL/year. The cumulative Cap credit since July 1997 is 49 GL (see **Table 5**).

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

Table 5: 2006/07 Diversions (Preliminary) Compared with Schedule F Targets (GL/year)

System	Long-term Diversion Cap (GL)	2006/07 Cap Target	Net adjustment to Cap Because of Trade	Diversions	Cap Credits (Cap Target less Diversion)		20% Schedule F Trigger
					2006/07	Cumulative* since 1 July 1997	
Goulburn/Loddon/Broken	2034	694	-52	715	-73	49	-407
Murray/Kiewa/Ovens	1702	1423	25	1466	-18	538	331
Campaspe	123	43	-	8	35	147	-24
Wimmera-Mallee	164	N/A	-	17	N/A	N/A	-32
Interim Mokoan allowance	22	22	-	-	22	220	-
Total			-27	2206			

Murray/Kiewa/Ovens

Resource availability

Unregulated inflows to Dartmouth and Hume reservoirs were 33% and 8% of the annual average. Lake Dartmouth reached 65% of capacity in early August 2006. Lake Hume was 22% in early July 2006 but did not rise above this level during the remainder of the year and was holding only 2.5% of capacity by mid-February 2007.

The poor recovery of Lake Hume required significant transfers from Lake Dartmouth to satisfy commitments downstream of Hume Dam. During the irrigation season there were relatively few rain interruptions requiring a rapid reduction in releases from Lake Hume.

Lake Victoria was 83% full during spring and had been drawn down to 32% by late April 2007. Inflows to the Menindee Lakes were very low. As a consequence, the total volume held in the Menindee Lakes did not rise above the 640 GL storage volume required to provide a regulated supplement to the Murray from the Menindee Lakes.

The opening allocation on the Murray system was 76% of water right, which increased to a final allocation of 95% by mid October 2006. The final Murray allocation was the lowest on record.

Cap compliance

Diversion from the Murray/Kiewa/Ovens valley was 1466 GL, which is 18 GL (less than 1%) above the Cap target of 1448 GL (with preliminary adjustment for trade). The diversion was 14% below the long-term Cap of 1702 GL/year. The cumulative Cap credit since July 1997 is 538 GL (see Table 5).

Campaspe

Resource availability

Inflows to Lake Eppalock were the lowest on record at only 2% of average. The storage held 3.7% of capacity at the start of the year and did not rise above that level. Lake Eppalock was at a record low level of only 0.7% towards the end of May 2007.

As in recent year, the Campaspe system was highly regulated during 2006/07. The Campaspe weir, was operated below full supply level to minimise evaporation loss and the risk of spills. No unregulated flows have passed Campaspe Weir since February 2005.

Due to the extremely poor resource position, the Minister for Water qualified rights to provide a limited supply for essential needs. No irrigation allocation was made available for the entire season although some irrigators could access water under qualification of rights conditions. Never before has there been a zero allocation in the Campaspe system for the whole season.

The minimum flow requirement downstream of the Campaspe siphon, which is tied to natural flows, was effectively zero for most of the year. After consultation with the Department of Sustainability and Environment, Goulburn-Murray Water (G-MW) transferred 10 ML/day from the Goulburn Inter Valley Trade (IVT) account to the River Murray via the Waranga Western Channel and the lower Campaspe River to maintain environmental values in the lower Campaspe River. This IVT water was transferred during the period from 8 December 2006 to 1 May 2007 except for a short period of 12 days in April 2007 when a higher flow up to 100 ML/d was provided. The total Goulburn IVT water transferred to the River Murray via the lower Campaspe River was 2.07 GL.

Cap compliance

Diversion from the Campaspe valley was 8 GL, which is 35 GL (81%) below the Cap target of 43 GL (no adjustment for trade is necessary). It appears that the Cap model may be underestimating river losses during the current extreme drought conditions. The model, which is operating well outside the climatic conditions under which it was calibrated, may have overestimated the water available to divert resulting in overestimates of Cap targets in recent years. This may need to be investigated if the extremely dry conditions continue.

Diversions were 94% below the long-term Cap of 123 GL/year. The cumulative Cap credit since July 1997 for the Campaspe valley is 147 GL (see Table 5).

Wimmera-Mallee

Resource availability

The 2006/07 season was again dominated by below-average inflows and the need to restrict supplies. This represented the tenth year of below-average inflows to the system. The storages remained low with five remaining empty and the others at very low levels. The maximum storage volume for the system was 7.2% in August 2006 and the minimum was 3.5% in mid April 2007.

This period also saw the third year of operation of the Wimmera-Glenelg Bulk Entitlement. The Bulk Entitlement operates over a water allocation year of November to October with the first allocation year being November 2004 – October 2005.

The total Bulk Entitlement allocation at the start of November 2006 was 23.5 GL. An available water volume of 208.5 GL is required before all entitlements defined within the Bulk Entitlement are met in full. Over the year the allocation rose due to above-minimum inflows but was only 54.4 GL at the start of September 2006. At this level it was sufficient for a restricted supply for the 2006/07 period and a reserve for towns supplied direct from headworks for the 2007/08 summer.

The level of restriction applied in 2006/07 was house dams or one dam per farm enterprise in the winter dam fill area (about 18% of dams). The remainder of the channel supplied domestic and stock (D&S) customers who were not supplied with any dam fills, but were given access to an emergency carting program.

Rural urban customers were placed on stage 4 restriction in November 2006 and remained at this level until end of season.

Customers holding specific "supply by agreement (SBA)" licences were restricted to 6% of their licensed volume. To assist supply by agreement customers, it was determined that water allocated for future development would be best distributed amongst SBA customers who are on channels running to town supplies and direct off head works. This water was allocated on the basis of estimations of minimum water required to maintain viability of these businesses during the year ahead.

There was no supply to irrigation during this period.

The environment received an allocation of 3.3 GL under the Bulk Entitlement. This was combined with the 50 ML of compensation flow for the Glenelg River downstream of Rocklands and 3.4 GL of entitlement carried over from the 2005/06 Bulk Entitlement year to provide a total volume of 6.7 GL. Environmental releases are made in accordance with the annual watering plan prepared by the Wimmera and Glenelg Hopkins Catchment Management Authorities with water supplies to the Glenelg, Wimmera and MacKenzie rivers. On August 8, 2006 the Victorian Government deferred environmental releases planned for the Wimmera and MacKenzie rivers due to concern about the extremely poor water resource outlook for the region. Consequently the environment's 6.7 GL allocation was not released and held as carryover water to be used for emergency supply if required. The 50 ML compensation flow allocation was made available to D&S customers downstream of Rocklands as part of the emergency carting program.

Water use data to the start of September 2007 indicates that all Bulk Entitlement holders will use less than their total allocation with the exception of GWMW.

Cap compliance

Diversion from the Wimmera-Mallee valley was 17 GL in 2006/07. An annual Cap target has not been calculated for this valley as, although a model has been built for the implementation of the Bulk Entitlement, refinements are required for it to be used for Cap compliance purposes. The interim estimate of the long-term Cap is 162 GL/year.

Diversions for 2006/07 were 10% of this long-term Cap. Usage has remained within Cap, as there have been significant water savings since 1993 through construction of the Northern Mallee Pipeline.

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 decision to Cap water use:

- restrictions on temporary and permanent water trading;
- reductions on 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 2006/07 and none are proposed for 2007/08 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 (BEs), 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*. Bulk Entitlements being developed for the Victorian portion of the Murray-Darling Basin are as follows:

- Birch creek – progressing and expected to be completed December 2007; and
- Snowy Environmental Reserve – An environmental entitlement for the Snowy Environmental Reserve was granted in June 2004. To date 7 GL of high reliability savings has been transferred from the Murray and 14.8 GL from the Goulburn. The volume of environmental entitlements in these Bulk Entitlements will be increased as other water-savings projects are undertaken;
- On 1 July 2007, as part of the unbundling process, low reliability water shares equivalent to 120 GL of long-term average use were transferred from Goulburn-Murray Water's Bulk Entitlements to the following environmental Bulk Entitlements.
 - Goulburn system – 141 GL of low reliability water shares for *The Living Murray*;
 - Campaspe system – 5.1 GL of low reliability water shares for *The Living Murray*;

- Loddon system – 2.1 GL of lower reliability water shares; and
- Murray system – 99 GL of low reliability water share for *The Living Murray*.

The volume of environmental entitlements in these BEs will be increased as other water-savings projects are undertaken for *The Living Murray* and other environmental initiatives.

Streamflow Management Plans

The Victorian Government's *Our Water Our Future 2004* set the strategic direction for where Stream Flow Management Plans (SFMPs) are required to improve environmental flows through the reduction of stress from low flow in summer. SFMPs set out clear objectives and actions for achieving sustainable Environmental Water Reserves.

In many cases, this will be through investing with farmers in offset measures to achieve increased environmental flows eg. building off-stream winter-fill dams. Plans will also clarify levels of reliability of supply for water users and include rules for rostering, trading and the granting of any new licences. Each SFMP is developed on behalf of the Minister for Water by a consultative committee consisting of water users, community, environmental and government agency representatives and in accordance with *Water Act 1989* provisions.

Our Water Our Future 2004 identified the following priority unregulated rivers in northern Victoria:

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

Supporting social surveys and technical studies required for the development of each of the above SFMPs, such as environmental-flows studies and hydrological models, have been completed or are in development. Consultative committees are expected to be appointed in the near future.

Irrigation Farm Dams

Victoria not only manages water in waterways, but also licenses the use of water for irrigation and commercial purposes in catchment dams under the *Water Act 1989*, as amended by the *Water (Irrigation Farm Dams) Act 2002*. All existing dams used for irrigation or commercial purposes were required to be either licensed or registered during the period 1 July 2002 to 30 June 2003. All new irrigation and commercial use of water must be licensed, whether the proposed dam is located on a waterway or not. Changes to the legislation have also led to the establishment of Permissible Consumptive

Volumes for catchments across the state and the establishment of exchange rates to ensure that the MDBC Cap is preserved when licences are traded.

Over 6000 catchment dams in the MDB south of the Murray River have been or are in the process of being licensed. New licence applications for catchment dams are subject to the MDBC Cap and new developers are required to purchase an existing entitlement before approval is provided.

Food Bowl Modernisation Project

Victoria is focused on improving the efficiency of irrigation delivery systems from about 70 per cent to 85 percent. These efficiency gains will free up resources to be used for commercially productive and environmental purposes underpinning future growth and confidence in the region.

During 2006/07 the Victorian Government committed to the *Food Bowl Modernisation Project* as part of a \$4.9 billion investment in major infrastructure projects announced as part of its *Own Water Our Future – The Next Stage of the Government's Water Plan*. The *Food Bowl Modernisation Project* encompasses the reconfiguration, rationalisation and modernisation of the Goulburn Murray irrigation system. The first stage of Modernising Victoria's Food Bowl is aimed to deliver up to 225 GL of water through efficiency improvements by 2012.

The savings from Stage 1 will be shared one third each by Melbourne, irrigators and the environment with each group getting an average of 75 GL/annum over the long-term. Victoria proposes to reduce the Cap by an amount of water allocated to the environment.

4.2.4 Proposals to Refine Implementation in 2007/08

Proposed refinements to the management of the Cap in 2007/08 include:

- Model for the Murray/Kiewa/Ovens valleys expected to gain Commission approval by June 2008; and
- A Cap compliance methodology for the Wimmera-Mallee Cap will be progressed during 2007/08.

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;
- water recovered for increased Snowy environmental flows; and
- water recovered for *The Living Murray* initiative.

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

4.2.5 IAG Assessment

Diversions in 2006/07 for Campaspe and Wimmera-Mallee were below Cap for the year. For the Goulburn/Broken/Loddon valley and the Murray/Kiewa/Ovens valley, the diversions were marginally above the Cap, although below the long-term Cap. Neither valley has exceeded the trigger necessitating a special audit.

All valleys have accumulated credits since 1997, although following recalibration of the Murray model, the cumulative Cap credit for that valley has been reduced by 308 GL. Diversions from the Murray/Kiewa/Ovens still remain well below the revised Cap.

Progress continues on developing, improving and accrediting models used to predict climate-adjusted diversion Caps. The model for the Goulburn/Broken/Loddon has been accredited and the Murray model has been recalibrated and is currently being accredited. The Cap compliance methodology for the Wimmera-Mallee Cap is being progressed. Examination of the results currently being produced by the Campaspe model suggest that it is overestimating the water available for diversion in the extreme drought conditions. Victoria has expressed some concern that the model is operating well outside the climatic conditions under which it was calibrated and that the method the model uses to estimate river losses in extreme droughts may need to be reviewed.

Once all models have been accredited and approved by the Commission, it is expected that the frequency of changes that have been made over the last ten years to the modelled annual Cap targets will be reduced. However the experience with the current drought highlights the fact that conditions will arise in the future which will be outside the bounds over which the models have been calibrated. At such times, it may become necessary to modify the Cap models to incorporate better modelling of the physical behaviour of the river system, or to include operating rules to handle those conditions, if it is believed that they would have been employed under 1993/94 levels of development. Any such changes to the models would have to be approved by the Commission.

The changes to the Murray model that were completed this year, and the changes that may need to be made in the future, affect the Cap credits on the Register. While the downward adjustment in Cap

credits for the Murray reported this year have little impact on the overall credits available in this system, there may come times when recalibration will result in net credit positions being reduced to net debit positions, possibly even triggering the requirement for special audits of the valleys concerned.

The IAG notes that the inclusion of allowances for water restrictions in the models used in Victoria lessens the potential over-estimation of Cap credits as they potentially arise when no allowance is made for such restrictions. The IAG envisages that with the continuation of the drought there will be a need across the whole Basin for the reassessment of the models used to ensure that they do not artificially inflate the value of Cap credits by failing to recognise the reduction in diversions caused by water shortage.

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

4.2.6 Conclusions/Recommendations

- Diversions in 2006/07 were 2206 GL compared to diversions of 3222 GL in 2005/06;
- Diversions for the Campaspe and Wimmera-Mallee in 2006/07 were below annual climate and trade-adjusted Cap targets;
- However, diversions for the Murray/Kiewa/Ovens valley and the Goulburn/Broken/Loddon valley were slightly above the annual Cap targets for the year;
- Cumulative diversions since 1997 for all valleys are in credit and are still well short of exceeding the trigger for a special audit;
- The Murray model has been recalibrated and is undergoing review prior to accreditation;
- Some discrepancies have been noted in the performance of the Campaspe model, and this will possibly be subjected to a further recalibration to take into account the current unprecedented drought conditions;
- Bulk water entitlements have been finalised for major valleys;
- Significant changes for Cap management and implementation will continue as a result of changes agreed to as part of the *National Water Initiative*, the *Living Murray* project and other specific Victorian Government projects (for example the *Food Bowl Modernisation Project*) particularly in relation to provision for water for the environment resulting from water saving projects and other initiatives.

4.3 New South Wales

4.3.1 The Cap

Assessment of Cap performance in NSW has been conducted on a valley-by-valley basis according to the requirements of Schedule F to the *Murray-Darling Basin Agreement*. Cumulative performance from 1997/98 relative to the Cap is assessed for all NSW valleys, which now have a common water year from July to June.

On 1 July 2004, Water Sharing Plans commenced in most of the major regulated valleys in NSW, including the NSW Murray and Lower Darling, Murrumbidgee, Lachlan, Macquarie, Namoi, and Gwydir valleys. These Plans are considered by NSW as representing a major milestone in the NSW water reform process, and a significant change in the nature of water licences. Each of the Plans sets in place a long-term diversion limit below Cap, and provides for a range of environmentally focused water management rules.

The annual Cap targets, and the long-term average Cap, are estimated in NSW using valley-scale hydrologic models that have been developed using the IQQM (Integrated Quantity Quality Model) software developed by the NSW government. Hydrologic models have been developed using IQQM for all major regulated river systems within the NSW portion of the Murray-Darling Basin, with the exception of the NSW Murray and the Lower Darling valleys, which are modelled by the MDBC using Murray Simulation Model (MSM).

The status of the various models used for annual Cap auditing in NSW is given in **Table 6** below.

4.3.2 2006/07 Usage

The IQQM models in interim (for the Border Rivers) and final 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 accumulated debit or credit, which is then compared to the Schedule F exceedance trigger. This exceedance trigger is 20% of the long-term average diversion generated from the analytical model.

Table 7 provides a summary of NSW diversions by river valleys. This table provides diversions, Cap targets and trade adjustments for 2006/07, along with accumulated credit or debit and identifies those valleys where accumulated debits have exceeded the Schedule F trigger. Some amendments have been made to the Cap targets, and accumulated credits or debits from previous years based on refinements and recalculations of the models.

Table 7 also provides additional information provided by NSW on differences in storage between that which is observed and that which is modelled. As shown in **Table 7**, only the Barwon-Darling Cap valley has exceeded the trigger for special auditing. But this valley is managed as a combined Cap valley along with Lower Darling. The combined Barwon-Darling/Lower Darling valley has not exceeded the trigger for a special audit. Of note this year is the changed Cap targets for the NSW Murray and Lower Darling, following finalisation of model recalibration and submission for accreditation. NSW Cap targets up to last year (2005/06) have reduced by 338 GL. This has, combined with last year's difference between the observed and simulated storage levels (431 GL), reduced Cap credits for the NSW Murray valley from +832 GL to +123 GL. At the same time in the Lower Darling valley, Cap targets have changed resulting in the combined Barwon/Upper Darling and Lower Darling valley no longer exceeding the trigger for special auditing.

Also of note is the reduced Cap credit for the Macquarie valley, resulting from the use of observed inflows to Burrendong Dam within the Cap model,

Table 6: NSW Cap Auditing Models Status

Valley	Auditing Tool	Comment
Murray / Lower Darling	Murray Simulation Model (Final)	Submitted for accreditation
Murrumbidgee	IQQM (Final)	Submitted for accreditation
Lachlan	IQQM (Final)	Approved for use under Schedule F
Macquarie	IQQM (Final)	Submitted for accreditation
Peel	IQQM (Final)	Submitted for accreditation
Namoi	IQQM (Final)	Approved for use under Schedule F
Gwydir	IQQM (Final)	Approved for use under Schedule F
Border Rivers	IQQM (Interim)	Definition of Cap not complete
Barwon-Darling	IQQM (Final)	Preliminary results available

Table 7: NSW Annual Cap Accounting 2006/07

System	Long-term Diversion Cap	2006/07 Cap Target	Net trade from valley	2006/07 Diversion	Cap Credits (Target less diversion)			Trigger Exceeded	Storage Difference (Model- Observed) ¹
					2006/07	Cumulative since 1/7/97	20% schedule Trigger		
Intersecting Streams	N/A	N/A	0	3	N/A	N/A	N/A	N/A	N/A
Barwon-Darling	173	1	0	1	0	-278	-35	Yes	N/A
Lower Darling	137	19	0	16	4	220	-27	No	-182
Combined Barwon-Darling & Lower Darling	310	21	0	17	4	-57	-62	No	-182
Border Rivers	N/A	N/A	0	135	N/A	N/A	N/A	N/A	N/A
Gwydir	344	81	0	140	-59	277	-69	No	-34
Namoi/Peel	264	147	0	154	-8	92	-53	No	-38
Macquarie/ Castlereagh/ Bogan	424	126	0	238	-112	63	-85	No	4
Lachlan	319	85	0	66	19	65	-64	No	-58
Murrumbidgee	2299	1248	96	950	203	1152	-460	No	-147
NSW Murray	1896	218	-45	602	-339	123	-379	No	-195
TOTAL	5861		51	2304		1715			

(1) A positive storage difference represents a potential Cap credit in future water years.

rather than simulated inflows.

The extreme dry conditions experienced in recent years are more extreme than the conditions over which most Cap models were calibrated. Under those conditions, continuing review of the models is required to ensure that the differences between the model targets and the diversions truly reflect the changes to the system rather than shortcomings in the models. In some instances, recalibration of models for these extreme conditions may be required.

Murray Valley

Resource availability

The 2006/07 water year saw the ongoing drought conditions worsen, producing the lowest ever recorded annual inflows to the valley. This has combined with record low storage levels from previous years of drought to result in the lowest water availability ever recorded. As it became clear that inflows were worse than the previous minimum inflows, the announced water availability was reduced. In NSW, access to a portion of the water in individual users' accounts was

withheld to ensure that critical urban, domestic, and stock needs could be provided.

Cap compliance

The Cap for the regulated sections of the Murray Valley is currently audited on a provisional basis using the Murray Simulation Model (MSM). Recalibration of the MSM to better represent 1993/94 conditions (commenced during 2002/03) has been completed, and the model submitted for accreditation. The results presented here have been produced from the model submitted for accreditation. Cap modelling excludes all Snowy borrows, which has the effect of reducing the current Cap credits.

The Schedule F accounting for the 1997/98 – 2006/07 water years indicates that the NSW Murray valley cumulative credits have reduced by over 650 GL. The valley is cumulatively only 123 GL below Cap. This is due to changes in previously advised annual Cap Targets (338 GL), and a Cap debit for 2006/07 of 339 GL.

Long-term modelling prior to recalibration indicated 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. This is currently the expected outcome of the NSW Water Sharing Plan rules.

Murrumbidgee Valley

Resource availability

As with the Murray Valley, the 2006/07 water year saw the ongoing drought conditions worsen in the Murrumbidgee Valley, producing the lowest ever recorded annual inflows to the valley. This has combined with record high river losses in recent years to produce the lowest water availability ever recorded. As it became clear that inflows were worse than the previous minimum inflows, the regulated Water Sharing Plan was suspended and the announced water availability reduced. As was the case in the NSW Murray Valley, access to a portion of the water in individual users' accounts was withheld to ensure that critical urban, domestic, and stock needs could be provided. Of the initial 95% allocation to high security users, and 15% to general security users, access to water equivalent to 10% of high security entitlement and 5% of general security entitlement was withheld from users on 11 November 2006. Subsequently, in late February 2007, access to water equivalent to 5% of high security entitlement was restored.

Cap compliance

Representation of the Lowbidgee district is included within the Murrumbidgee IQQM, which has been submitted for accreditation. The results presented here exclude Snowy borrows from the Cap modelling, which has the effect of reducing the current Cap credits.

The Schedule F accounting for the 1997/98 – 2006/07 seasons indicates that the total Murrumbidgee Valley is cumulatively 1152 GL below Cap, although the difference between observed storage levels and those simulated under Cap conditions at 30 June 2007 indicate that 147 GL of Cap debits may occur in the near future. Despite recalibration of the Murrumbidgee IQQM in recent years, the record high river transmission losses that have been observed in recent years continue to be underestimated by the model, which has the effect of increasing Cap credits. This underestimation of losses within the model represents about half of the volume of credit currently accounted. Current modelling indicates that long-term diversions would be around 1.5% below Cap.

Lachlan Valley

Resource availability

Very low inflows in 2006/07 have seen a return to the severe water shortage provisions between towns, high security, and stock and domestic users that have been in place since 2003 (with the exception of 2005/06).

This has involved an allocation of 80% to towns, domestic and stock, and other high security users, and very limited releases for other purposes.

In September 2003, severe water shortage provisions were introduced that suspended the rules relating to the environmental "translucent" releases (a proportion of inflows to Wyangala dam), reduced end-of-system flow requirements, and allowed differential sharing arrangements between high security water users based on water requirements. Whilst the *Lachlan Water Sharing Plan* commenced on 1 July 2004, inflows to Wyangala over the last three years have been the lowest on record, and thus the severe water shortage provisions have remained in place throughout this period.

Cap compliance

The Lachlan IQQM Cap scenario modelling has been independently audited and approved for use under Schedule F of the *Murray-Darling Basin Agreement* by the Murray-Darling Basin Commission. The Schedule F accounting for the 1997/98 – 2006/07 seasons indicates that the Lachlan Valley is cumulatively 65 GL below Cap, although the difference between observed storage levels and those simulated under Cap conditions at 30 June 2007 indicate that 58 GL of this Cap credit could be used in the near future. Long-term simulations indicate that average annual current conditions diversions under the Water Sharing Plan are 3% below Cap diversions.

Macquarie Valley

Resource availability

Whilst high security, domestic and stock, and town water users received 100% allocations, drought conditions in the Macquarie Valley during 2006/07, resulted in no general security allocation being made. A volume equivalent to 28% of general security entitlement was carried over from the previous water year, which was fully used. During the year there was also 5 GL of supplementary access from tributary inflows downstream of the major storage.

Towards the end of 2006/07, intensifying drought conditions led to the suspension of the regulated Water Sharing Plan.

Cap compliance

At the end of the 2005/06 water year, the annual Cap accounting indicated that the Macquarie valley was 789 GL below Cap. Initial modelling for the 2006/07 year indicated that the Macquarie valley was around 1000 GL below Cap. Such large Cap credits are mostly the result of simulated inflows to Burrendong Dam significantly exceeding observed inflows during the extended drought period over the last 5-6 years.

Despite ongoing recalibration work over recent

years, and re-submission of the Cap model for audit in 2006, the simulation of inflows to Burrendong Dam within the Macquarie IQQM is continuing to overestimate observed inflows during this very dry period, and consequently overstating Cap targets. This effect can be countered by the use of observed inflows to Burrendong Dam within the Cap model. Advance comments on the Gwydir Cap model from the independent auditor indicate that use of observed inflows to the storage is recommended over simulated inflows.

Accordingly, the Cap modelling results for this valley in 2006/07 and summarised in Table 7 have been modified to use observed inflows to Burrendong Dam. This revised modelling indicates that the Macquarie valley has a cumulative Cap credit from 1997/98 to 2006/07 of 63 GL. For Cap purposes, results are considered preliminary at present until the revised model is independently audited under the provisions of Schedule F of the *Murray-Darling Basin Agreement*. For comparison, the long-term simulations favoured by NSW indicate that average annual current conditions diversions are 12% below Cap levels.

Namoi/Peel Valley

Resource availability

The Namoi valley consists of three distinct systems: the main Namoi Valley, the smaller Peel River system and Manilla River/Upper Namoi system. Whilst high security, domestic and stock, and town water users received 100% allocations in all systems, intensifying drought conditions in the Namoi, Manilla and Peel systems during 2006/07, resulted in no general security allocations being made. A volume equivalent to 24% of general security entitlement was carried over from the previous water year in the Namoi, which was fully used.

Cap compliance

Diversions for the combined valleys have been below the annual Cap targets since 1997/98 by a cumulative total of 92 GL. The observed storage levels are around 40 GL higher than those simulated in the Cap model, which may reduce Cap credits in subsequent years. The Namoi IQQM Cap scenario modelling (covering both the Namoi and Manilla/Upper Namoi systems) has been independently audited and approved for use under Schedule F by the *Murray-Darling Basin Agreement*. A Peel IQQM Cap scenario has also been submitted for independent audit.

Long-term simulations indicate that average annual current conditions diversions are 7% below Cap diversions for the Namoi regulated system.

Gwydir Valley

Resource availability

Whilst high security, domestic and stock, and town water users received 100% allocations, intensifying drought conditions in the Gwydir Valley during 2006/07, resulted in no general security allocation being made. A volume equivalent to 28% of general security entitlement was carried over from the previous water year, which was fully used.

Cap compliance

The Gwydir Cap model has been submitted for independent review under the established MDBC process. The results indicate that diversions are cumulatively 277 GL below Cap since 1997/98, and the difference between observed storage levels and those simulated under Cap conditions at 30 June 2007 indicate that 34 GL of Cap credits could be used in the near future. Long-term simulations indicate that average annual current conditions diversions are 13% below Cap diversions for the Gwydir regulated system.

Border Rivers

Resource availability

The water year commenced in the NSW Border Rivers with moderate availability of water in individual accounts, equivalent to 45% of the valley general security entitlement. An additional 25% became available through the year, primarily during the summer period.

Cap compliance

The Border Rivers IQQM has been configured to produce a draft Cap that would include an allowance for the enlarged Pindari Dam. NSW and Queensland have also agreed on modelling to determine state shares, and the eventual NSW Cap modelling will reflect this work. However, a formal Inter-Governmental Agreement (IGA) with Queensland on water sharing arrangements, and hence the NSW Cap, is still being finalised.

As part of the process of finalising the IGA, a trial implementation period of the water sharing arrangements with Queensland was undertaken during 2005/06 and 2006/07 to assess the suitability of the arrangements and to allow for a period of public consultation to occur. The draft IGA envisages each state being limited to its long-term diversion as existed under 2002 levels of development, with the application of environmental flow rules. Subject to agreement on floodplain harvesting activities, this is estimated to provide an end-of-system flow at Mungindi of around 61% of the natural flow. This is the volume of flow expected at Mungindi under the November 1999 conditions.

It is intended that the provisions of the IGA will be embedded in the NSW Water Sharing Plan, (and referred to in the Resource Operations Plan for Queensland). The terms of the IGA will result in a Plan Limit of around 191 GL/year. This is approximately 4% below the long-term diversions under the Cap that is likely to be proposed by NSW.

At the May 2006 Ministerial Council meeting, NSW indicated that it would bring forward a proposal for a Cap on the NSW Border Rivers following the trial period for the IGA water sharing arrangements. Finalisation of the IGA has been delayed by both the NSW state election in March 2007, and negotiations around the federal water legislation. It is now anticipated that the IGA will be agreed and signed between NSW and Queensland during the 2007/08 year.

Intersecting Streams

Cap compliance

The Warrego, Paroo, Culgoa, Narran and Moonie Rivers flow across the NSW-QLD border, and the reaches of these rivers that are within NSW are designated as the "Intersecting Streams" valley under Schedule F to the *Murray-Darling Basin Agreement*, for Cap accounting purposes. Presently, no Cap has been formally established for these rivers, and there is no monitoring of usage. However, "Macro" Water Sharing Plans for unregulated areas within NSW are currently being established, which will:

- facilitate conversions of licences to the new *Water Management Act 2000*;
- provide a frame-work for establishing Caps; and
- allow for more detailed water access rules for sub-catchments where there is significant competition for resources – either between consumptive users, or users and the environment.

These Macro Plans will apply to the intersecting streams, as well as the unregulated areas of other valleys.

No Schedule F accounting is currently available for the intersecting streams. The IAG was advised that there was very little water available from these streams during 2006/07, reflecting the continuing drought conditions.

Barwon-Upper Darling Valley

Resource availability

Following the 1999/00 review of Cap Implementation, 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.

NSW has recently implemented a new Cap strategy, similar to those applied in other unregulated streams in NSW. The water entitlements have been restructured to ensure that future diversions do not exceed the long-term Cap. The new Cap arrangements apply from 1 July 2007 and include:

- the reduction of existing licensed entitlements to the volume of the long-term diversion Cap, which is currently assessed at 173 GL/year;
- a commencing account volume that represents the volume that would have been available had the licence restructure occurred in 1993/94 (182.8 GL); and
- unlimited carryover of allocated water from one water year to the next, and the introduction of a trading framework.

Because the accounting for the new strategy commenced in 2005/06, there is already an additional carryover of 187 GL as a result of the low usage over the last two years. Therefore, as at 1 July 2007, the water allocated to the Barwon-Darling licence holders totals 543 GL.

NSW intends to develop a Water Sharing Plan for the Barwon-Darling valley, which will incorporate this proposed Cap strategy to protect volumetric growth, as well as event-based access rules that will protect important flows for the environment and downstream users.

Cap compliance

The Barwon-Darling IQQM Cap scenario has been calibrated, and is available for long-term and annual Cap simulations to assess Cap compliance. For Cap purposes, results are considered preliminary at present until the model is independently audited under the provisions of Schedule F.

The preliminary Schedule F accounting for the 1997/98 – 2006/07 period indicates that the Barwon-Darling Valley is cumulatively 277 GL above Cap, and remains well above the 35 GL trigger for special auditing based on 20% of the estimated long-term diversion Cap.

Whilst diversions have exceeded annual Cap targets, they have averaged 153 GL during the 1997/98 – 2006/07 period, which is below the long-term diversion Cap of 173 GL. It is argued by NSW that the new licensing arrangements currently being implemented will ensure that future diversions also remain close to the long-term Cap as defined under the current Schedule F. However, NSW has agreed to a climatically-adjusted Cap for the Barwon-Darling at the 1993/94 level of development. The mechanism proposed by NSW to limit allocations to a long-term average figure of 173 GL/year will not ensure compliance with the Cap under drier than average conditions in the future.

Lower Darling

Resource availability

With drought conditions intensifying, full allocations were made to high security and town water users, but no allocations were possible for general security, and there was no supplementary access.

Cap compliance

Recalibration of MSM to better represent 1993/94 conditions (commenced during 2002/03) has been completed, and the model submitted for accreditation. The results presented here have been produced from the model submitted for accreditation. Preliminary assessments indicate that long-term current diversions are very close to those that which would have occurred under Cap conditions.

The preliminary Schedule F accounting for the 1997/98–2006/07 period indicates that the Lower Darling Valley is cumulatively 220 GL below Cap.

Combined Barwon/Upper Darling and Lower Darling Cap Accounting

Cap compliance

The preliminary Schedule F accounting for the 1997/98–2006/07 period indicates that diversions in the combined Barwon-Darling and Lower Darling Valleys are cumulatively 57 GL above Cap, but below the combined trigger for special auditing of 62 GL. This is an improvement over the period to 2005/06 where the Schedule F accounting suggested the combined Barwon-Darling and Lower Darling Valleys exceeded Cap by 143 GL. This reduction in debits is due almost entirely to the increase in annual diversion targets that resulted from the recalibration of the Lower Darling model.

Because the trigger is no longer exceeded, the IAG recommends that the Commission revoke its declaration that the combined valley is in breach of the Cap. However in making this recommendation, the IAG notes that:

- the outcome in 2006/07 may reflect the emergency measures taken in response to the drought when the Water Sharing Plans for this combined valley were suspended and additional restrictions were put in place to maintain supplies for critical urban and industrial users;
- the IAG recommends that all models be reassessed to ensure that the Cap targets produced in extreme dry years properly reflect the restrictions that would have been applied if similar conditions had been experienced prior to 1993/94. When this is done for the Lower Darling, the credit in that valley may reduce;

- The method proposed by NSW for managing usage in the Barwon-Darling involves incrementing the allocation by 173 GL/year regardless of the climate conditions experienced. The credit currently stands at 543 GL which will mean that this control is unlikely to limit diversions until a number of wet years have been experienced.

4.3.3 Monitoring and Reporting

NSW has now finalised all of its IQQM models for each of the valleys in the system, and four are currently awaiting final accreditation clearance before being submitted for approval under Schedule F. With the completion of these models, together with some further recalibration to take into account the current drought, the Ministerial Council and the Commission can have greater confidence in the Schedule F reporting results.

The use of IQQM models and NSW's own long-term modelling 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 availability of water in past periods 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.

The IAG recognises that models may need to be recalibrated if conditions are experienced that are outside those that occurred during the period over which the model was originally calibrated. The IAG has confidence in the models but recognizes that the need to recalibrate the models raises some concern about the reliability of the models that are used to measure performance against the Cap.

The process of review and accreditation used with the IQQM models is designed to give assurance to the Council and the Commission of the performance of each of the valleys against the Cap. NSW has favoured the use of its long-term modelling for this purpose together with the operation of its Water Sharing Plans as the means of addressing over-Cap outcomes. The validity of testing compliance by comparing a "current condition" model run with a benchmark is dependent on the current conditions being accurately represented, and this representation has never been subjected to independent assessment. Given that NSW is committed to the use of this technique to manage to its Water Sharing Plan limits, and to guide its policy response to allocation issues, the IAG considers that there would be merit in having these "current condition" models independently reviewed and assessed. In this way, the Council and Commission could be given additional assurance as to NSW's compliance with Cap and the Water Sharing Plan limits.

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 been converted from area-based to volumetric licences in recent years. 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 therefore been identified in **Table 8**.

Unmetered-use estimates are taken from the volumetric conversion process (2000), based on crop areas surveyed 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 unmetered users according to the average 1993/94 – 1998/99 diversion estimate arising from the volumetric conversion process. Presently, no Cap has been formally established for these rivers, and there is no monitoring of usage. However, “Macro” Water Sharing Plans for unregulated areas within NSW are currently being established.

4.3.4 Administration of the Cap

NSW has adopted a series of water management and allocation rules (Water Sharing Plans) that manage the level of diversions within the Cap. These rules, which include the Environmental Flow Rules that NSW had previously introduced, are designed to ensure that diversions from the various valleys comply with the Cap in the longer-term. The Water Sharing 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 intensified drought conditions, particularly in the southern NSW valleys has resulted in the suspension of regulated Water Sharing Plans for the NSW Murray, Lower Darling, Murrumbidgee and Macquarie/Cudgegong valleys. The Water Sharing Plan for the Lachlan valley also remains suspended. This has allowed emergency measures to be taken, such as: suspending access to water in individual users accounts to ensure supply to critical urban and industrial users, suspension of some environmental flows, and new accounting arrangements for users (for example, carryover for high security users, lifting of trade restrictions).

The impacts of record low inflows to many valleys have yet to be fully felt and there will be a wider debate about what (if any) measures should be taken to ensure water security for higher priority water users such as towns and intensive use industries.

Table 8: 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	2004/ 05	2005/ 06	2006/ 07
Murray	28	0	0	0	0	0	0	0	0	0	0
Lower Darling	0	0	0	0	0	0	0	0	0	0	0
Barwon-Darling	0	0	0	0	0	0	0	0	0	0	0
Murrumbidgee	42	0	0	0	0	0	0	0	0	0	0
Lachlan	15	0	0	0	0	0	0	0	0	0	0
Macquarie	35	3	22	16	21	15	0	9	3	10	1
Namoi	78	0	0	0	0	0	0	0	0	0	0
Peel	0	0	0	0	0	0	0	0	0	0	0
Gwydir	10	1	1	4	0	2	0	0	2	1	0
NSW Border Rivers	14	0	4	2	2	2	0	5	3	4	0
Intersecting Streams	3	0	0	0	0	0	0	0	0	0	0

4.3.5 IAG Assessment

The extreme drought conditions in 2006/07 in NSW have raised a number of issues related to the assessment of Cap compliance. Firstly NSW has noted that some of the drought management rules used last year had not been used before. To address issues along the Murray for example, NSW and Victoria agreed to put aside their normal water sharing arrangements and address priority needs on both sides of the river as water supplies have continued to dwindle and pressures mount on users. The diversion of water between jurisdictions outside of normal rules and protocols raises the question about whether special changes need to be made to the Cap models to handle these conditions. If it is believed that those rules would also have been used in 1993/94 then it would be appropriate that they be included in the Cap model. Secondly, the modelled drought losses in the Murrumbidgee, for example, appear to be too low and this may be contributing to the large Cap credits in that valley. Both of these issues suggest that the recalibration of some NSW Cap models should be considered.

Although the combined Barwon-Darling/Lower Darling no longer exceeds the trigger for declaration of Cap breach under Schedule F, the IAG notes that the performance of the valley is very close to the trigger point for declaration. Furthermore, the model for the Lower Darling is currently being recalibrated in the context of the current drought conditions. As a result of this recalibration, and taking into account the impact of the drought conditions which are expected to reduce the annual Cap targets for the Lower Darling, it may then be that the valley is found to be still in breach of the Cap. With the Barwon-Darling still significantly exceeding its cumulative Cap performance, it would not take much of an adjustment to the Lower Darling model for the combined Barwon Darling/Lower Darling system to again exceed the trigger under Schedule F. In these circumstances therefore, the IAG expresses its concern that further action by NSW may be required to return the combined valleys to a longer-term balance not withstanding the argument from NSW that the Caps now adopted represent the long-term Caps which should ensure that from this time forward the valleys do not exceed the overall Cap. This argument fails to address the fundamental problem of the carry forward of the existing over-allocation and the need to bring this back into balance.

NSW has always claimed that its Water Sharing Plans and long-term modelling should be seen as being the correct mechanism for managing the State's valleys such that they remain within their Water Sharing Plan limit and that NSW should be acknowledged for its achievements in terms of its "Statewide" Cap credit. The IAG does not believe that a Statewide Cap outcome is the appropriate way to assess the performance of

the NSW Cap management arrangements or those of any other State or Territory. The IAG notes that the Cap is by definition designed to achieve an outcome in each valley, not an average State result, although by necessity the management and auditing of the results is at a jurisdictional level. The IAG also considers that it would be appropriate, given NSW's reliance upon its long-term modelling to justify its interpretation of whether or not it has met the Plan limits and whether action it has taken will achieve Cap compliance, that the representations of current conditions in NSW long-term models should be subjected to regular independent assessment and accreditation.

As with other States, the IAG notes that the continuing drought has instigated extreme restrictions on taking water as a means of conserving available water supplies. In instances where these restriction rules have not been included in models, Cap credits have grown. This growth does not reflect efficiency savings or other action taken that would support the creation of a Cap credit, but rather reflects a shortcoming in the modelling of Cap conditions. As a result, the IAG believes that the Cap credits are being artificially inflated in a manner that is inconsistent with the intention of the Cap credit management arrangements.

To address this issue, the IAG is recommending that full allowance be made in all climate-adjusted modelling for the impact of water restrictions. Where such provisions do not exist, the IAG recommends that they be introduced and applied in a uniform manner across the Basin.

In its 2005/06 report, the IAG noted that subtraction of the Mulwala Loss Allowance from the NSW Murray diversion is not permissible under the current rule as defined in the *Diversions Definition Register*. However the IAG recognised that the Council may choose to change the rule by amending the *Diversions Definition Register* and allowing the subtraction. No decision has been made by Council to allow this adjustment. However, it appears that NSW has not fully corrected its record of observed diversions on the Cap Register. This matter needs to be resolved as a matter of some urgency as it affects the assessment of Cap compliance in the NSW Murray valley.

The combined Barwon-Darling/Lower Darling Cap valley is no longer in breach of the trigger for a Special Audit. Other valleys also appear to be within the Cap, although a final position on the Border Rivers (including Pindari) must await final agreement on the Cap for this system. There has been progress on negotiations between NSW and Queensland on the Cap for the Border Rivers. Finalisation of an IGA is expected during 2007/08 and this is expected to allow the determination of a Cap for this system by mid-2008. The IAG notes that this is a further 12 month delay over what had been reported in its 2005/06 Report.

NSW has now completed work on the preparation of IQQM models and all but two of these have either been submitted for accreditation or have been formally approved for use under Schedule F.

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

4.3.6 Conclusions/Recommendations

- Diversions in 2006/07 were 2304 GL compared to 5038 GL in 2005/06;
- Cap models have been approved for three NSW valleys and been submitted for accreditation for another five valleys. Only the models for the Barwon/Darling and Border Rivers are outstanding;
- Further recalibration of some models may be required to cover the recent extreme conditions that were not experienced in the period over which the models were calibrated;
- NSW should submit its “current conditions” modelling to independent audit;
- The Mulwala Loss Allowance should not be subtracted from the NSW Murray Cap diversion under the current rule. As noted in the 2005/06 IAG Report, should the Council choose to change the rule by amending the *Register of Diversion Definitions* in future to allow the Mulwala Loss Allowance subtraction, the IAG recommends that the Council should give prior consideration to the consequences of the decision on the integrity of the Cap;
- The preliminary Schedule F accounting for the 1997/98 – 2006/07 period indicates that diversions in the combined Barwon-Darling/Lower Darling Cap valley are cumulatively 57 GL above Cap, but below the combined trigger for special auditing of 62 GL;
- The IAG therefore recommends that the Commission revoke its declaration that the combined Barwon/Upper Darling and Lower Darling valley is in breach of the Cap;
- However, the IAG is concerned that following the completion of the current work to include a restriction policy in the Lower Darling Cap model, it may subsequently be found that the combined Barwon-Darling/Lower Darling remains in breach of the Cap;
- 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 has previously expressed concern that the Border Rivers will be found to be in breach once a Cap is defined. Finalisation of a Cap together with agreed Water Sharing Plans are expected by mid-2008 with the final agreement to an IGA between NSW and Queensland expected to occur by the end of 2007;
- 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; and
- Accumulated diversions have been below the Schedule F trigger levels for other valleys in NSW.

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 of the *Murray-Darling Basin Agreement* 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 statutory framework 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*, Resource Operations Plans are developed to implement the provisions of the Water Resource Plans. Diversion caps for Queensland valleys are implemented as part of the monitoring, auditing and reporting provisions of the Resource Operations Plan.

Administrative holds on the issuing of new licences have been in place in all Queensland Murray-Darling valleys since prior to March 1995 (major sections of the Lower Balonne have had administrative holds in place since October 1991 and other sections including the majority of the Border Rivers since 1992). Following the introduction of the *Water Act 2000* in September 2000, the administrative holds were replaced by moratoriums on the issue of new licences and the development of new works associated with those licences. The moratorium also applied to new overland flow works to take water for other than stock and domestic purposes since September 2000 (Condamine

and Balonne and Border Rivers) and June 2001 (all other valleys).

Following completion of the water planning process, Cap proposals for the Warrego, Paroo, Nebine and Moonie valleys were submitted to the Murray-Darling Basin Commission in October 2006. These were subsequently approved by the Ministerial Council at Meeting 42 (25 May 2007).

Accreditation of Cap models for those valleys is presently underway and the first full Cap audit has been undertaken for the 2006/07 water year.

Cap proposals for the Border Rivers and Condamine and Balonne valleys will be submitted within 6 months of the completion of the water planning process for those catchments.

4.4.2 2006/07 Diversions

It is only possible to compare annual diversion targets with observed diversions for the Warrego, Paroo, Nebine and Moonie valleys. In each case annual diversions in 2006/07 were significantly less than target diversions as can be seen in **Table 9**.

As a consequence of the rules-based approach adopted in Queensland, annual diversions are compared with target diversions on an annual basis. There is no cumulative accounting of Cap credits/debits for the Warrego, Paroo, Nebine and Moonie valleys.

For the Queensland Border Rivers and the Condamine and Balonne actual diversions only have been provided.

By comparison to previous years, diversions from the Queensland system were the lowest level since the commencement of the Cap. (**Table 10**)

Table 9: Annual Diversions Compared to Cap Targets (GL)

System	Long-term Diversion Cap	This Year's Cap Target	Net Trade from Valley	This Year's Diversion	Cap Credits (Target less Diversion) This Year	Trigger Exceeded	Diversion as a % of Cap Target	Overland Flow Take not included in Cap Diversion
Warrego*	47.90	37.90	0.00	12.50	27.40	No	33%	8.00
Paroo*	0.18	0.18	0.00	0.02	0.18	No	8%	2.00
Nebine	6.40	2.30	0.00	0.08	6.40	No	3%	0.00
Moonie	34.90	12.40	0.00	9.50	2.90	No	77%	0.00
Border Rivers	N/A	N/A	0.00	69.00	N/A	N/A	-	-
Condamine and Balonne	N/A	N/A	0.00	48.80	N/A	N/A	-	-
TOTAL				139.90				

* Values do not include overland flow

Table 10: Queensland Basin Diversions (GL)

Year	Diversions (GL)
(1) 1993/94	336
(2) 1994/95	176
(3) 1995/96	528
(4) 1996/97	467
(5) 1997/98	741
(6) 1998/99	609
(7) 1999/00	541
(8) 2000/01	688
(9) 2001/02	341
(10) 2002/03	214
(11) 2003/04	815
(12) 2004/05	392
(13) 2005/06 ¹	305
(14) 2006/07	140

1 Annual reporting for the Moonie, Nebine, Warrego and Paroo changed in October 2005 from Oct-Sep to Jul-Jun.

Warrego

Resource Availability

Rainfall was slightly above average for the Warrego catchment, particularly in the mid and lower catchment, with 310 mm recorded at Cunnamulla for the 2006/07 water year against an average of 226 mm. Rainfall was reasonably well distributed throughout the year though limited in the north-eastern part of the catchment.

Average annual flow at Wyandra is 473.9 GL and at Cunnamulla 304.8 GL. Streamflow discharge volume for the Warrego River at Cunnamulla for the 2006/07 water year was 870.2 GL, slightly higher than the 599.9 GL recorded in 2005/06.

The traditional summer flow pattern was again experienced this year with an event in early February (peaking at 5.4 GL per day) followed by a smaller event in March. The flow distribution this year was quite variable with some gauging stations recording no flow for the 2006/07 period.

The water supply scheme based on Cunnamulla Weir provides supplemented water in the Warrego catchment. The announced allocation for 2006/07 was 100%. Total supplemented water taken for the year was 2.0 GL.

The majority of take in the catchment is associated with water allocations with flow conditions (water harvesting). Although total flow volumes were below average, flows continued for a reasonable duration affording some access above flow conditions. Total take of unsupplemented water was 10.5 GL.

Estimates of take are based on a combination of measurements and assessments. Metering of some of the larger works has been deferred until further development of the National Standards has occurred and it is clear what criteria and specifications apply to this category of diversion. Measurement trials are currently underway for some of the more difficult pipe and channel diversions.

Overland flow take for the catchment is estimated at 8 GL based on known development and opportunity.

Overland flow take has not been included in Cap auditing due to a lack of information on overland flow infrastructure in the Warrego catchment. It is intended to further refine the volume of overland flow take once sufficient metering data has been recorded to allow a review of this section of the audit model.

Cap Compliance

Annual diversion was only 33% of the Cap target so there are no compliance issues and no action is required.

Paroo

Resource Availability

Rainfall recorded for 2006/07 at Hungerford in the southern part of the Paroo catchment was over double the long-term average of 156 mm. The peak rainfall received was in March with 133 mm falling – against the long-term average for March of 12 mm.

Average annual flow at Caiwarro, the last gauged point on the Paroo in Queensland, is 477.3 GL per year (1968 to 2007). While the average is quite high, flows are highly variable.

Streamflow for 2006/07 at Caiwarro was 251.7 GL, just over half the annual average and well above the 34.9 GL recorded in 2005/06. The majority of streamflow occurred in the first 3 months of 2007 with the largest event peaking at 19 GL per day in late January 2007.

There are only two unsupplemented water allocations in the Paroo catchment, one without a flow condition (irrigation) and the other for town water supply for the town of Hungerford.

The total volume of water taken by water allocations was 15 ML with over two thirds of that taken for town water supply at Hungerford. Take is measured by metered works.

Overland flow take for the catchment is estimated at 1950 megalitres based on known development and opportunity. Overland flow take has not been included in Cap auditing due to a lack of information on overland flow infrastructure in the Paroo catchment. It is intended to further refine the volume of overland flow take once sufficient metering data has been recorded to allow a review of this section of the audit model.

Cap Compliance

Annual diversion was only 8% of the Cap target so there are no compliance issues and no action is required.

Nebine

Resource Availability

Rainfall was above average in the Nebine catchment with 390 mm recorded at Mulga Downs for the 2006/07 water year against an average of 260 mm. The mean annual flow from the Nebine catchment (including Noorama and Widgeegoara Creek's) is 32.5 GL per year. Flows discharge into the Culgoa River.

The recorded average annual flow in Wallam Creek at Cardiff (120 km upstream of the Queensland/New South Wales border), is 11.9 GL per year (2000 to 2007). While this average flow is small, this is not necessarily indicative of flows in Wallam Creek as the gauging station has only been operational for a short period.

A new gauging station has been completed and started recording on 30 May 2007 at Roseleigh Crossing (on Nebine Creek). This gauging station is 10.5km upstream of the Queensland/New South Wales border.

Flows in Wallam Creek in the Nebine catchment for the 2006/07 water year were the second lowest in the short record, with total streamflow discharge recorded at 3.3 GL. The flow was split between two small events in January and March 2007.

There are only three unsupplemented water allocations with flow conditions (water harvesting) in the Nebine catchment and a single water licence for diversion for direct irrigation.

The limited development in this catchment together with limited flows restricted the volume of water taken to 30 ML, with nearly a third of this taken for the town water supply at Bollon.

Take is measured by metered works. Overland flow take for the catchment is estimated at 50 ML.

Overland flow take is included in the Cap volume and has been based on an estimate of overland flow infrastructure in the Nebine catchment. It is intended to further refine the overland flow take volume once sufficient metering data has been recorded to allow a review of this section of the audit model.

Cap Compliance

Annual diversion was only 3% of the Cap target so there are no compliance issues and no action is required.

Moonie

Resource Availability

Rainfall was below average across the catchment during 2006/07. Rainfall in Nindigully, located along the Moonie River in the south west of the catchment, was 313 mm for the year compared to the average of 355 mm. Above average rainfall in November and December "wetted up" the catchment and subsequent average and above average rainfall in January and February and heavy rain in the upper catchment area in March resulted in streamflow events in these months.

Streamflow volumes were well below average for 2006/07. The Fenton gauging station is located 20 km upstream from the Queensland/New South Wales border. Total streamflow measured for 2006/07 at Fenton was 10.5 GL. This is well below the recorded average of 141.6 GL.

The Nindigully gauging station is located upstream of Fenton at AMTD 95 km. Total streamflow measured at Nindigully for 2006/07 was 22.2 GL also well below the historical average of 116.2 GL.

A new gauging station was installed at Flinton (AMTD 231 km) in February 2006 to assist in Resource Operations Plan monitoring and was operational over the 2006/07 year. Ratings are still to be confirmed for this station.

The majority of flow occurred in a single event in February 2007 peaking at over 2.8 GL per day at Fenton.

There are no supplemented water allocations in the Moonie catchment. The majority of take from water courses in the catchment is under the authority of unsupplemented water allocations with flow conditions (water harvesting) with limited volumes taken under water allocations without flow conditions (direct irrigation) and water licences authorised to take for stock and domestic purposes.

The limited flows restricted water harvesting opportunity during the year and total take under the authority of water allocations was limited to 8.5 GL in a catchment with approximately 21 GL of offstream storage based on streams.

Estimates of take are based on a combination of measurements and assessments. Metering of some of the larger works has been deferred until resolution of National standards. Measurement trials are currently underway for some of the more difficult pipe and channel diversions.

Overland flow take for the catchment is estimated at 1 GL.

Overland flow take is included in the Cap volume and has been based on an estimate of overland flow infrastructure in the Moonie catchment. It is intended to further refine the volume of overland flow take once sufficient metering data has been recorded to allow a review of this section of the audit model.

Cap Compliance

Annual diversion was only 77% of the Cap target so there are no compliance issues and no action is required.

Queensland Border Rivers

Resource Availability

Rainfall was generally below average across the Border Rivers area. Records at Stanthorpe (October to September) show a total of 532 mm against an annual average of 646 mm. The highest monthly rainfall recorded was 130 mm in November – nearly double the average. While the Stanthorpe (Granite Belt) area of the Border Rivers was only a little below average, other areas were markedly drier. Goondiwindi (located centrally in the catchment) recorded 263 mm against a long-term average of 487 mm. Above-average falls were recorded in June and August which, while localised, did result in some minor streamflow events late in the water year for this catchment. Rainfall during the traditionally wetter months (summer) was absent.

There were several smaller events from November 2006 though to March 2007, with more significant flows in July and August/September 2007. The latter flows peaked at 5 am and 7 GL per day respectively at Goondiwindi. A total of 228.8 GL passed through Goondiwindi for the year commencing 1 October 2006. These flows include supplemented releases from the dam storages in the catchment. Flows over Mungindi Weir for the same period totalled approximately 64 GL. Flows at Mungindi generally don't include supplemented releases but water is lost to the floodplain between Goondiwindi and Mungindi. There

was no contribution from the Weir River for the year. Average annual volume of flow at Goondiwindi is 915.4 GL.

There are two major water supply storages in the Queensland part of the Border Rivers catchment. At 1 October 2007, Glenlyon Dam, the major storage for the Dumaresq Water Management Area was at 26% capacity with 33 GL of water available for general use from the Queensland share of the storage. This increased slightly with minor inflows in November 2006 and August 2007 but generally the storage depleted during the year and was at 16% capacity with only 5 GL available for use from the Queensland share of the storage on 1 October 2007.

Coolmunda Dam on the Macintyre Brook is the major storage for the Macintyre Brook Water Supply Scheme. On 1 October 2006, Coolmunda Dam was at just under 50% capacity and an announced allocation of 61%. Although there was very little inflow into the storage during the year, the announced allocation was able to be revised several times with a final announcement of 100% in April 2007. The storage was just under 25% capacity at 30 September 2007.

An estimated total of 40 GL of supplemented water was taken for use within the Dumaresq Water Management Area. This included supplemented take from natural flows in the system and 4 GL provided from the Macintyre Brook Water Supply Scheme. A total of 11 GL of supplemented water was taken in the Macintyre Brook Water Supply Scheme.

The August/September 2007 flow was the only flow which triggered water harvesting access under the trial water sharing rules currently in place on the Border Rivers. The event provided Queensland with slightly more than a day of water harvesting opportunity and 10 GL of take. The majority of this water was taken straight onto ground "wetting up" in preparation for the 2007/08 summer crop. Although there were no flows in the Weir River that triggered water harvesting thresholds, breakout flows from the Border Rivers into the Lower Weir River filled "in stream" weirs and a further 6 GL was taken from weir storage. Approximately 2 GL is estimated to have been taken from smaller events in the Granite Belt.

Cap Compliance

The water planning process has not yet been completed for this valley, therefore it was not possible to undertake a Cap audit for 2006/07.

Condamine and Balonne

Resource Availability

Condamine

Rainfall was generally well below average across the Condamine area. This continues the trend of significantly below average rainfall since 2000.

Rainfall distribution was relatively even although the eastern and northern escarpment areas received the lowest falls. The year started poorly with no rainfall recorded across the catchment in October. Rainfall recorded at Warwick was not dissimilar to Stanthorpe, its near neighbour in the Border Catchment. The highest fall at Warwick was recorded in November although above average rainfall was also recorded in June. Dalby and Chinchilla both recorded their highest monthly totals in June (over 300% of long-term average in both cases). This along with above average rainfall in August and near average in September led to some small streamflow events over this period in the mid to lower Condamine area.

Streamflows were very limited throughout the Condamine catchment during the year with no flow recorded past Cecil Plains Weir or Chinchilla Weir. Minor flows occurred in the Condamine downstream of Dalby in June and August/September 2007. Several town water supplies were at critical levels prior to the June 2007 flow with water supply for the township of Warra (between Dalby and Chinchilla) failing in May 2007 and water trucked in for almost two months. Flows in June 2007 were held in Chinchilla Weir because of the critical water supply situation for the town of Chinchilla. Low flows were passed through Chinchilla Weir in the August/September event.

Smaller flows occurred downstream of Chinchilla in both events with flow wetting the channel right through to Beardmore Dam. Total flow through Cotswold gauging station (where the Condamine River becomes the Balonne) was limited to 10 GL with 3 small events peaking up to 0.7 GL per day from February through to September 2007. Total flow through Cotswold was the 3rd lowest in the 40 year record and well below the long-term average of 591.3 GL.

The extreme situation with regard to town water and riparian stock and domestic supply saw limitations imposed on water harvesting access during the year. The limitations varied from delayed starts imposed in December 2006 to a total ban introduced in June 2007. Town water supply remains critical for the township of Cecil Plains with emergency bore supplies currently being accessed and Dalby has not had access to surface water for several months.

The major storage for the Upper Condamine Water Supply Scheme, Leslie Dam, was at slightly better than 10% capacity on 1 October 2006 and has fallen to 7% capacity during the year. There was no announced allocation for medium priority allocation in the scheme. The townships of Warwick and Cecil Plains have high priority allocation in the scheme. Warwick was able to be supplied throughout the year as it draws directly from Leslie Dam, however difficulties were encountered in maintaining a supply for Cecil Plains with their local weir on the Condamine River falling to critical levels.

Chinchilla Weir was at 35% capacity at 1 October 2006 with an announced allocation of 22 % limited to those on the weir storage only. Inflows occurred in June 2007 with passflows suspended following the June inflow to protect town water supply for the town of Chinchilla. The weir was at 40% capacity at 1 October 2007.

The availability of water in the two water supply schemes saw town water use exceed that for irrigation with 1.8 GL used for town water supply and only 0.8 GL for irrigation purposes.

The limited flows restricted water harvesting take to only 3 GL for the year, most of which was taken from tributary streams.

A further 7 GL of water was taken for direct irrigation, the majority of which was taken from flows supplemented by treated effluent discharged from Toowoomba city.

Balonne

Rainfall in the Balonne was significantly below average at little more than half the long-term average across the Balonne area. This continues the trend of significantly below average rainfall records since 2000.

There were a number of small streamflow events in the Balonne occurring from November 2006 through to April 2007 both in the Maranoa and Balonne Rivers.

On 1 October 2006, Beardmore Dam and associated storages were just below 40% capacity holding about 39 GL. The storage included 0.7 GL of stock and domestic water. Inflows during the year increased availability of both allocation and stock and domestic water however storage didn't vary greatly with the dam at just over 15% capacity at 1 October 2007.

A total of 68.4 GL flowed into Beardmore Dam over the year with individual flows peaking at up to 3.5 GL per day. Inflows up to 0.7 GL per day may be passed downstream for stock and domestic supplies or are sometimes held in storage for later release to maximise the benefit to downstream water users.

A high proportion of the inflows were captured in the dam as stock and domestic water but flows during the year also added to available water allocations.

Flows downstream of Beardmore Dam were limited to releases for stock and domestic supply. Stock and domestic storage of 1.5 GL and ongoing inflows triggered a release of stock and domestic water in January 2007. Supplemented by ongoing low flows, the release continued through to April 2007, with total of about 30 GL passed downstream during the year. A further release commenced on 28 September 2007 with over 11.5 GL of stock and domestic water held in storage. This release is not expected to cease until mid November 2007.

Water use in the Balonne was limited to water made available from the St George Water Supply Scheme with the limited flows providing no water harvesting opportunity. Total water use was 36 GL, about 32.5 GL of which was taken through the channel system into the St George Irrigation Area. The high proportion of use in the irrigation area is a symptom of the very dry conditions, with irrigators reluctant to take water downstream because of the high level of losses.

Cap Compliance

The water planning process has not yet been completed for this valley, therefore it was not possible to undertake a Cap audit for 2006/07.

4.4.3 Monitoring and Reporting

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 and 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 are a package of strategic level rules detailing:

- how water will be shared between consumptive users, the environment and downstream users;
- the conversion of existing entitlements into volumetric tradable water allocations;
- the identification of unallocated water to address critical future water requirements; and
- how to manage 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.

Major achievements in 2006/07 in terms of monitoring and reporting have been:

- Caps for Warrego, Paroo, Nebine and Moonie valleys being approved by the Ministerial Council; and
- Cap models for the above valleys submitted for accreditation.

Planning for the Border Rivers and Condamine and Balonne catchments had continued and are expected to be finalised later in 2007 and in early 2008 respectively.

Border Rivers

In the Border Rivers Catchment, an interim Inter-Governmental Agreement that deals with interstate water sharing and access arrangements for the Border Rivers catchment has been negotiated between Queensland and New South Wales. The interim Inter-Governmental Agreement was prepared in consultation with the Interstate Water Management Working Group, comprising of representatives of water user groups from each State, who provided advice to the Border Catchments Standing Committee on the development of the key elements of this agreement. It is intended that the provisions in the interim Inter-Governmental Agreement will be reflected in Queensland's Resource Operations Plan and the New South Wales Water Sharing Plan. The Resource Operations Plan for the Border Rivers is expected to be finalised by late 2007 and the Cap proposal will be submitted within six months of finalisation of plan. This is a delay of twelve months over what had been reported in the IAG's 2005/06 Report.

The draft Resource Operations Plan for the Border Rivers has been developed in consultation with the local community. The IAG notes that the CSIRO Report on Sustainable Water Use is expected to be released in the near future and the findings of this research may impact the timing for the finalisation of the Resource Operations Plan and the Cap. Should further delays occur this will only serve to extend the period over which negotiation and finalisation of a Cap with its associated working rules and operating arrangements has been undertaken with consequential implications for the setting of a Cap for this valley. Under the legislated arrangements in Queensland, the final agreement on the Resource Operations Plan and the Cap will be subject to review every ten years to ensure that the Resource Operations Plan is continually updated.

Condamine and Balonne

On 12 August 2004, the Water Resource Plan for the Condamine and Balonne catchment was released. The Plan was finalised after a long period of community consultation and incorporates advice from advisory committees, reference groups, community organisations, irrigators, graziers, members of the local community, industry groups, local councils and government agencies as well as independent scientists.

The Plan seeks to provide a framework for the sustainable management and use of water in the Condamine and Balonne catchment and allocates water to support the social, economic and environmental requirements of the catchment and downstream parts of the catchment.

A draft Resource Operations Plan was released for public submissions in April 2007 and the Plan was re-released in July 2007 in order to convert a number of entitlements in the Lower Balonne which were not able to be included in the initial draft Plan. It is expected that the Resource Operations Plan will be finalised by early 2008 and a Cap proposal submitted within six months of finalisation of the Plan. Full auditing on a Schedule F basis will not be possible for the Condamine Balonne system before the 2008/09 year.

Metering

Queensland released a policy on metering water extractions in May 2005 providing a framework for metering across the State. The policy includes metering standards, details of ownership, maintenance and reading of meters, and proposed charging arrangements. In brief, the Department of Natural Resources and Water will organise the supply, installation and maintenance of water meters in accordance with standards provided in the policy. Ownership of water meters will remain with the department with costs associated with metering recovered from water users through an annual metering service charge.

The metering project will see the staged introduction of water metering for all unsupplemented water extractions across Queensland over the coming years. The development of a Resource Operations Plan in each water resource plan area will generally trigger implementation of metering. As far as possible, metering will be scheduled to be completed in each resource operations plan area at or near the finalisation of the Plan.

4.4.4 IAG Assessment

Diversion of 140 GL in 2006/07 were considerably lower than the 2005/06 diversions of 305 GL, and reflects the severity of the drought across the relevant catchments.

For those valleys where Caps have been set, the diversions in 2006/07 fell well within the Cap targets.

The Caps for all systems in the State cannot be finalised until the planning process is completed. With the finalisation of this process for the Warrego, Paroo, Nebine catchments and Moonie River, this year's report has been able to report on performance against the Caps. The Water Resource Plans for the Border Rivers became law in December 2003 and for the Condamine and Balonne in August 2004. Since then work has progressed on developing the Resource Operations Plan. The current October 2007 status is:

- Border Rivers – An interim Inter-Governmental Agreement that deals with interstate water sharing and access arrangements for the Border Rivers catchment has been negotiated between Queensland and New South Wales. The Resource Operations Plan for Queensland together with the Cap to be finalised before the end of 2007/08,
- Condamine-Balonne – a draft Plan has been released for public submission and the Plan is scheduled to be finalised in early 2008 and the Cap proposal to be submitted within six months of a finalised Plan.

Queensland has committed to submit Cap proposals to the Murray-Darling Basin Commission for each of the valleys within six months of completion of the relevant Resource Operations Plan. The IAG notes that the impending release of the CSIRO Sustainable Yield Study may impact upon the finalisation of the Caps for these valleys. Given the progress that has been made over many years, and the opportunity for review of the Caps over time based on better science and data, further delay in finalising these Caps would be inconsistent with the overall objective of enforcing Cap compliance across the whole of the Basin.

Submission of Cap proposals following finalisation of Resource Operations Plan is not in line with expectations of the Murray-Darling Ministerial Council. Council has previously determined that the Caps for the Queensland Murray-Darling Basin valleys be audited by the IAG prior to incorporation into Schedule F.

Queensland has previously advised Council that this is not possible under the *Water Act 2000* where the Chief Executive Officer must undertake his statutory decision making responsibilities without constraint by external decision-makers, e.g. Council. The original requirement would introduce the risk of legal challenge and possible voiding of the Water Resource Plan. This reduces the role of Council to receiving advice on decisions by Queensland on the Cap. The IAG, however, would still provide independent advice to Council on the Queensland Cap proposals.

The IAG expects to audit the Border Rivers and (possibly the Condamine Balonne) Caps in time for the Caps to be effective for the 2007/08 year.

There is progressive introduction of metering as the Resource Operations Plan are finalised. Some 1700 sites will be assessed for metering of surface water diversions in Queensland Murray-Darling Basin valleys. A high proportion of these is already metered but these sites will need to be assessed to determine whether they meet the Departmental standards.

A strategy and resourcing for monitoring diversions is in place. This will enable relatively accurate measurement other than for overland flow diversions and end-of-valley flows and provide a sound basis for compliance audits. In addition, Queensland has introduced a strong compliance program across the whole State which effectively monitors the operation of licences and offtake of water in accordance with those licences. Queensland has had some success in the Courts and is actively sending a signal to the community that compliance with licence conditions will be strictly enforced, thereby improving community confidence in the water management arrangements across the State.

4.4.5 Conclusions / Recommendations

- Diversions in 2006/07 are estimated at 140 GL, the lowest since 1993/94;
- Cap figures for Queensland Murray-Darling Basin valleys have now been set for the Warrego, Paroo, Nebine Catchments and the Moonie River, and these systems have all been found to be within Cap;

- Resource Operations Plan for the Border Rivers and the Condamine Balonne system are expected to be finalised by late 2007 and early 2008 respectively and Queensland expects to submit the Cap proposals within six months of the finalisation of these plans;
- Queensland has agreed that the associated models will be submitted for technical audit and subsequent accreditation by the Murray-Darling Basin Commission upon finalisation of the Resource Operations Plan;
- An interim Inter-Governmental Agreement that deals with interstate water sharing and access arrangements for the Border Rivers catchment has been negotiated between Queensland and New South Wales;
- Queensland has committed to submit Cap proposals to the Murray-Darling Basin Commission within six months of finalisation of the Resource Operations Plan;
- There is also an expectation by the Murray-Darling Basin Ministerial Council that Queensland will place a proposal for Cap figures for each valley before Council before finalising the statutory process; and
- A metering program will ensure reliable information on water use is available as the Resource Operations Plan are implemented.

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. This commitment to the Cap has been reaffirmed at subsequent Council meetings, most recently at the May 2006 Council meeting when the ACT became a full member of the MDBC. A decision as to what is to be the ACT's Cap has yet to be made, although the ACT has now submitted a proposal which is discussed further below. Net ACT consumption is approximately 0.3% of overall Basin water 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 26 GL per year with an additional 5 GL per year estimated for all other consumptive diversions (see Table 11). For the 2006/07 year, the ACT has been able to provide meter-based usage data for other off takes, and these are reported below.

In 2006/07 as in recent years, 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. During the 2006/07 year, ACT was on Level 3 restrictions from November 2006. The ACT Government has also introduced permanent restrictions as part of a broader policy to conserve water.

The ACT Government's water strategy is embedded in its *Think Water, Act Water* statement in which it is proposing a 25% reduction in the per capita consumption of water in the ACT over the next 20 years and a greater use of recycled water to replace existing potable water use.

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.

Table 11: 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	32.6	3.4	5.0	34.5
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	65.9	30.6	3.8	5.0	36.4
2002/03	65.8	28.4	2.3	5.0	40.1
2003/04	52.8	27.8	2.2	5.0	27.8
2004/05	51.8	27.3	2.4	5.0	27.1
2005/06	59.1	29.0	3.1	5.0	32.0
2006/07	51.0	26.4	3.3	3.7	25.0

In August 2005, the ACT Government introduced a two year moratorium on the issuing of new surface and groundwater extraction licences. This was to allow the ACT Government time to examine the impact of the current use of groundwater and the basis on which any future licences should be allocated. During 2006/07, the ACT completed a process of metering groundwater and other diversions. These uses are also licensed, and the ACT is able to manage the use of water from sources in addition to potable water reticulated for general domestic use across the Territory. The total licensed volume in the ACT is 67.5 GL of which 63.8 GL is issued to ACTEW and 3.7 GL is issued to other surface and groundwater users.

In the first half of 2006, the ACT completed the negotiation of an agreement with the NSW and Federal Governments for the supply of water outside of the Territory. Currently the ACT supplies the water requirements of Queanbeyan, but in recent years, with the expansion of residential areas on the borders surrounding the ACT and water supply shortages in surrounding rural cities such as Goulburn and Yass, there has been a growing debate on the supply of water from the ACT to these locations.

Under the agreement reached between the three governments, the ACT will make available water to these areas in NSW subject to certain conditions, one being that the water provided will be deducted from the NSW Murrumbidgee Cap. At this time there are no firm plans to provide water beyond Queanbeyan.

4.5.2 Administration of the Cap

The *ACT Water Resources Act 1998* (the Act) has been revised, and the relevant legislation governing the licensing and measurement of water is the *ACT Water Resources Act 2007*. This Act 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 diversions are metered. The National Capital Authority (NCA) which is responsible for the supply of water (other than potable water) provided to public parks and facilities in the Parliamentary Triangle, does not report its diversions. The NCA pumps water from Lake Burley Griffin. While the actual diversions are not known at the time of completing this report, the IAG understands that they could be as high as 0.6 GL. There is a need for these diversions to be determined and included in any reporting of water use in the ACT. The Act also requires that environmental flows must be provided for before any other use. Environmental flow guidelines provide for the protection of flows

up to the 80th percentile and, except in water catchments, only 10% of flows over the 80th percentile are available for consumptive use. Of the total ACT water resources of 494 GL per year, these guidelines allocate an average of 272 GL to the environment leaving around 222 GL (gross) notionally available for consumptive use (this is excluding 386 GL of water that flows into the ACT via the Murrumbidgee River and is primarily allowed to pass through the ACT although some pumping of Murrumbidgee flows has occurred in response to the drought).

Gross diversions for consumptive use have only been around 55 to 65 GL per year over recent years, and net diversions use around 31 GL.

4.5.3 ACT Cap Proposal

The ACT Government has submitted a proposal for the setting of a Cap for the ACT. The proposal has been made in fulfilment of the ACT's commitment to the Council at the time of its initial participation in the MDBC that an acceptable Cap under Schedule F would be forthcoming.

The ACT has argued in its Cap proposal that special consideration needs to be given to its unique position as the National Capital and the requirement to provide Queanbeyan with water. The ACT has also noted the communiqué issued at the time of the First Ministers' meeting on the National Plan for Water Security in 2007² where it was agreed that:

"A diversion Cap for the ACT will be negotiated fairly and reasonably, taking into account the future growth needs of the National Capital and region".

In noting the unique nature of the ACT as the location of the national capital, the ACT proposal draws attention to the existence of legislation establishing the ACT (*Seat of Government Acceptance Act 1909*) and the paramount rights to the water of the Territory, the Molonglo and Queanbeyan Rivers given to the ACT for the purposes of the national capital. The establishment of the National Capital Plan under the *Australian Capital Territory (Planning and Land Management) Act 1988 (Cth)* provides the basis for policies relating to the river corridors in and surrounding the ACT, and provides a maximum volume for water abstraction of 108.3 GL. It is argued by the ACT that neither the Commonwealth nor the ACT shall do anything that is inconsistent with the National Capital Plan. Thus the 108.3 GL is argued as being a 'holistic ceiling' on the volume of water that can be extracted for ACT water use.

2 25 February 2007

The ACT argues that:

“The ceiling of a value of 108.3 GL is consistent with ensuring that the ACT has an economically sustainable Cap for net extraction and provides for long-term water security of the ACT”.

Based upon this position, the ACT has proposed the following Cap:

- (i) *“Net Cap level incorporating:*
 - a. *Long-term Cap of 108.3 GL net diversions.*
 - b. *Annual Cap equal to 42 GL net as at 2006.*
 - c. *Annual Cap will be reviewed yearly and increased by the factor, 0.75 of the population growth of Canberra and Queanbeyan.*
 - d. *Annual Cap to be climate adjusted using the ACTEWAGL demand model.*
- (ii) *Cap credits*
 - e. *Cap credits as already determined by the IAG for the ACT from 1997 should be recognised. At 2006 the ACT has a cumulative credit of 62.8 GL as per the IAG, March report.*
- (iii) *Trading*
 - f. *In relation to trading there are three quantities that could be traded:*
 - 1. *the difference between the long-term Cap and the Annual Cap. The ACT proposes to not trade within this difference, except in (2) below.*
 - 2. *the difference between the Annual Cap and Actual Usage (the right to trade out of the ACT to realise benefits from reduced usage achieved through efficiency gains).*
 - 3. *usage above the long-term Cap, will require trading to meet demand in the future if credits from previous under use have been realised.*
- (iv) *Groundwater is to be included in the Annual Cap.*

Any significant industry demand for water, for example plantation forestry or new industrial use would be provided by water trading thereby limiting the ACT Cap water use to existing levels and future population related increase.

Any additional future Commonwealth use of water in the ACT is to be provided for by water trading”.

It is also proposed by the ACT that its commitment to make permanent savings of 2 GL under the Living Murray program would be reflected in the Cap. Thus, rather than a Cap of 42 GL as outlined above, the initial Cap would be reduced by the 2 GL to 40 GL.

4.5.4 IAG Assessment of the Cap Proposal

The IAG has established a series of six principles as a guide to its consideration of matters relating to the setting up operation of the Cap. These principles have been endorsed by Council and are therefore the basis upon which the ACT Cap proposal should be considered. Each of these principles will be addressed below, noting that the ACT proposal has also sought to address these principles.

- (a) *No further changes be made to flow regimes that would contribute to deterioration of water quality and environment protection.*

The ACT proposal has given considerable attention to the policies of the ACT towards ensuring sustainable use of its water resources. In particular, emphasis has been placed on the *Think Water, Act Water* initiatives which are designed to reduce water consumption in the ACT by 25% by 2025 and achieve increased treated wastewater reuse to 20% by 2013. The ACT has also emphasised the fact that considerable volumes of water are allowed to pass through the ACT and released from ACT catchments as environmental flows.

Notwithstanding these commendable credentials in terms of ensuring environmental requirements are given first priority, the ACT submission argues that this principle has been developed “against the background of a fully if not over-allocated system”. The ACT submission continues:

“It is recognised that on one interpretation of no net growth the ACT is not consistent with this basis but can be demonstrated to be consistent when considered in the context of statutory rights under the National Capital Plan providing for extractions of 108.3 GL and the ACT Water Resources Act having legislated for environmental flows with a balance of water availability that can be drawn upon to underpin population growth in the same way other jurisdictions allow population growth to be underpinned by movement of water from agricultural uses”.

From an environmental perspective, there are some inconsistencies between arguing that the Cap for the Basin was set in the context of over-allocation of water rights while at the same time proposing a model that, far from being a “Cap” on water use, is actually a population-based growth model for water diversions. There is a tendency in the arguments used in the ACT proposal to treat the Territory as a separate entity from the remainder of the Basin and that decisions taken in the ACT and for the ACT do not have an impact on the remainder of the Basin.

There was recognition at the time of setting the Cap that over allocation has occurred and that it would take joint action by all jurisdictions to prevent further allocations being made which, while not necessarily directly detrimental to their own jurisdiction or regional location, would have consequential adverse effects on other parts of the Basin. While there have been a number of decisions taken by Council based on IAG advice that have related to the setting of a Cap for different valley systems, the IAG has refrained from arguing for a Cap mechanism which allows growth in the Cap over time. Rather, the approach taken has been to set a Cap and, subject to the use of climate-adjusted modelling and recalculation of these models as more reliable information becomes available, to hold to this Cap and report usage against this Cap figure.

The IAG is therefore not convinced that the ACT proposal meets the principle of no further changes in flow regimes that would contribute to deterioration of water quality and environmental protection especially in the context of the total valley and Basin flows.

(b) Water allocations be made with extreme sensitivity to the effects on the environment (the Precautionary Principle).

Following on from the previous principle, it is not clear that the ACT proposal meets the Precautionary Principle. For other towns on the Murray-Darling system, the IAG has recommended that the initial Cap be set at water volumes required to meet Year 2000 population numbers. When applying this rule in 1996 when the Caps were initially set, the IAG sought to recognise that there needed to be sufficient water for urban consumptive use, but like other diversions from the Basin system, there needed to be an absolute Cap in place if the agreed concept of a Cap over the total Basin was to be effective. Thus, the IAG made allowance for some growth in population, up to the year 2000, but applied the Precautionary Principle by not accepting arrangements for the growth in Cap to accommodate further population growth. Rather, consistent with the principles that water be allocated to its highest value use, the IAG allowed trading in water and greater efficiencies in water use, to be the mechanism that would meet future water needs in a Basin where water was already over-allocated.

The ACT has argued that it is not able to move water from agricultural use within the Territory to urban use as is possible in other States. However, this fails to recognise that interstate

trading is now occurring and can be expected to increase, especially as the full implication of the operation of the Cap is felt throughout the Basin. In addition, other urban areas (and in particular Adelaide) have already commenced buying water entitlement from interstate to meet growing urban (and surrounding peri-urban) needs.

The Precautionary Principle requires that further allocation of water does not occur and that the Cap be applied fairly and consistently across the Basin. This is in line with the First Ministers' statement of February 2007 and with the Cap determination practice and principles applied to other parts of the Basin.

(c) Water is allocated to the highest value use (allocative efficiency).

Weakening the Cap by a "growth Cap" will reduce the incentive and requirement for water to move to its highest value use. The ACT proposal does give this principle some recognition when it notes that the difference between its "long-term Cap" (108.3 GL) and "annual Cap" would not be available for trade (and thus would not contribute to a growth in water allocation across the Basin). However, the ACT proposal still incorporates a growth element in the proposed population indexing mechanism. This "annual Cap" will increase from year to year, with the ACT being able to trade the difference between the "annual Cap" and "actual usage" thereby reducing the value (and thereby the incentive for highest value use) that is an essential part of the current Cap mechanism in use across the Basin.

(d) Statutory and agreed property rights to be recognised.

The ACT proposal puts emphasis upon this principle, arguing that its rights under various pieces of legislation provide the basis for its claim up to a 108.3 GL net Cap to be accepted. The IAG notes these arguments based on statutory entitlements. However, the IAG also notes that other States, in agreeing to the Cap, have had to forgo their "rights" in terms of the water that could be diverted from the Basin for consumptive use. The decision by member States of the MDBC to implement a Cap on diversions reflected a recognition that there were wider national "rights" and responsibilities that went beyond those of any individual MDBC member. In endorsing its commitment to a Cap when it joined the MDBC, the ACT effectively recognised the wider rights of all jurisdictions located in the Basin and the responsibility to treat as secondary to this wider Basin interest any rights held by the individual jurisdictions.

Notwithstanding the need to recognise the rights of others as other States have been required to do, the ACT should expect a fair and reasonable Cap in accordance with the First Ministers' communiqué. As is outlined below, the IAG believes that it is possible to meet this objective for a fair and reasonable Cap without the need for a growth Cap of the type proposed by the ACT.

(e) Water Management provisions to be transparent and auditable.

The proposal envisages a transparent and auditable process for managing the Cap. The ACT has in place the necessary regulations requiring licensing of surface and groundwater diversions, and has recently completed a program of installing meters on groundwater offtakes. The ACT is proposing the use of the ACTEW Corporation demand model and a climate-adjusted modelling approach. Any models for use as part of the operation of the Cap are required by the Schedule F and Cap administration rules to be independently accredited, and this requirement would apply to the ACTEW model. The IAG would recommend that, consistent with the proposal in this Annual Cap Report, the models used by the ACT make allowance for restrictions on water usage as part of any mechanism to calculate an annual climate-adjusted Cap and determine whether usage generates credits or debits.

(f) A system of administration be implemented which is easily understood and which minimises time and costs (administrative efficiency).

The ACT proposal meets this requirement.

In summary, the IAG is not convinced that the ACT proposal meets the principles for Cap determinations agreed by Council. In particular, the IAG considers the ACT proposal to have failed the Precautionary Principle, as it ultimately represents a "growth" Cap which can effectively more than triple the current average net diversions taken by the ACT. Notwithstanding the statutory "rights" claimed by the ACT, the IAG considers that on an equity basis if for no other reason, the ACT proposal should not be accepted as it effectively undermines the fundamental objectives of the Cap and potentially would provide a precedent that others may seek to follow.

The IAG recognises however there is a need to finalise and agree on a Cap for the ACT which is "fair and reasonable" and consistent with the six principles agreed by Council. Therefore, the IAG proposes an alternative which is built on an approach consistent with that adopted when the Cap was originally set for towns located in the Basin.

The approach proposed by the IAG is based on the following:

1. The Cap be determined based upon the population for the Year 2000.
2. The Cap will be a net-diversions Cap including the provision of water to Queanbeyan, all government and public use water, groundwater and other diversions within the ACT, including those diversions from Lake Burley Griffin made through the National Capital Authority.
3. The Cap model will be a climate-adjusted model with provision for Cap credits and debits, in line with the Cap accounting arrangements used in Victoria, NSW and South Australia (with the exception of Metro Adelaide which is a rolling average Cap).
4. The Cap model to include provision for diversions to be reduced for the impact of water restrictions.
5. The ACT be given credit for any water-efficiency savings that it has made to date.
6. The Cap be reported through the normal Schedule F accounting arrangements and audited in the normal manner.

The IAG has prepared its own estimate of the ACT Cap based on this approach. As with the ACT proposal, the IAG has also made allowance for the 2 GL saving to be made under the ACT's commitment to the Living Murray project.

The IAG's indicative Cap proposal for the ACT, as reported in previous IAG Annual Reports was based on the 1991 *per capita* usage and the June 1994 population levels and resulted in a long-term average Cap diversion of 38.2 GL/year. Adjusting this demand to the June 2000 population level, as recommended by the IAG in its 1996 *Setting The Cap* Report, would increase this average to 40.7 GL. Including the estimated 0.6 GL of diversions from Lake Burley Griffin made through the NCA would increase this volume to 41.3 GL which the IAG is prepared to round up to 42 GL. After allowing for the 2 GL savings under The *Living Murray* program, this would set the Cap for the ACT at 40 GL.

In arriving at this Cap number, the IAG notes that its original Cap model was based upon 1991 *per capita* demands and made no adjustments for any efficiencies made since that time. Thus, the ACT has retained these efficiencies in its Cap. In addition, the ACT proposal reports that the introduction of permanent water conservation measures since 2000 has conservatively provided a minimum reduction of at least 5 GL. With the exception of the 2 GL saving allocated to The *Living Murray*, this efficiency saving has also been allowed to remain in the Cap, consistent with the precedent adopted across other jurisdictions.

The IAG has noted in its discussions on South Australia that the use of Cap models which do not allow for restrictions in times of drought generate large credits at those times. The IAG considers this to be inappropriate and recommends that the proposed ACT Cap model incorporate water restrictions based upon the current infrastructure. Once this model has been developed, model demand should be scaled up so that the long-term average diversions from the Cap model equal 40 GL. Once developed, this new Cap model should be used to assess ACT performance since July 1997 and the ACT should be entitled to maintain any credits so calculated. Under the IAG's 38 GL Cap model, Cap credits of 62.8 GL would have been generated by 2006 and similar credits would be expected under the proposed Cap. No restriction would be placed on the trading in these credits other than the requirement that the ACT would remain within its Cap. The trigger point from a Special Audit under the Cap accounting rules would be a debit of 8 GL or greater.

Effectively therefore, the ACT through its water conservation and "best practice" water and environment management policies would be well placed to meet any projected growth in population over the next 50 years. Rather than the Cap, the only constraint on the ACT would be its ability to access high security water to meet its future water needs. The IAG believes therefore, that its alternative proposal of a climate-adjusted Cap of 40 GL fully meets the growth and security objectives of the ACT without needing to breach the principles embodied in the operation of the Cap across the Basin.

4.5.5 Monitoring and Reporting

The ACT has established a system of volumetric licences for all users of water in the ACT. The ACT will be able to report its consumptive usage against information provided by licence holders. As ACTEW Corporation will be the main licensed user of water from the system, the level of accuracy from this monitoring process should be high. The issuing of licences to groundwater users and the finalisation of the current metering program together with the licensing of catchment infrastructure on small catchments (such as farm dams) has filled any possible gap in the collection of data on water use in the ACT.

4.5.6 2006/07 Diversions

Net diversions by the ACT in 2006/07 were 25 GL. As an example of the assessment under a climate-adjusted Cap arrangement, this diversion has been compared with the level of diversion expected under a 40 GL long-term Cap as proposed by the IAG above.

The 2006/07 diversion is 26.2 GL below the 51.2 GL annual climate-adjusted Cap target. **Table 12** summarises the ACT's performance against a 40 GL Cap since July 1997. It reveals that had a Cap of 40 GL been supported, it would have already built up a credit of 107 GL. The large credit calculated this year occurs because the diversions were restricted but the Cap model developed by the IAG does not allow for diversions being restricted by water availability. The credit assigned to the ACT under the IAG proposal would need to be recalculated once the climate-adjusted model proposed by the ACT (including restrictions in times of drought) has been calibrated as discussed above and submitted for independent assessment as required under Schedule F.

4.5.7 Other Issues

In considering the mechanism to apply to a climate-adjusted Cap, the IAG has noted for other jurisdiction in the MDBC that there is a need to take into account reductions in water consumption that may have occurred not as a result of efficiencies in use but as a result of restrictions being placed on water use. In the current climate of prolonged drought, the ACT has adopted water restrictions with the current restrictions at Level 3. Failure to make some allowance for these restrictions on the quantum of water that could be diverted during the year will result in Cap credits increasing beyond the level which reflects the true savings that have been made. In this context, the IAG is proposing that water restrictions be factored into the determination of the climate-adjusted Cap for any individual year in which water restrictions apply, thereby avoiding a situation where at the end of the drought, large quantities of credits could have been accumulated which have little to do with actual water efficiencies that have been achieved over the period of the restrictions.

Table 12: An Example of a Cap Applied to the ACT – GLs Diversions since July 1997 Compared with a Notional 40 GL Cap

Notional Long-term Diversion	2006/07 Climate-adjusted Target	Diversions	Credits (proposed Climate-adjusted Cap Target less Diversion)		20% Long-term Cap Diversion Trigger
			2006/07	Cumulative since 1 July 97	
40	51.2	25	26.2	107	-8

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. The IAG has reviewed the proposal for a Cap made by the ACT, using the principles developed as part of the original determination of Cap levels. The IAG is not convinced that the ACT proposal meets these principles, in particular the need to apply the Precautionary Principle and the need to limit further growth in water diversions from the Basin. The ACT Cap proposal is based on a population-growth model and effectively allows the Cap to grow over time. This type of model has not been used in other parts of the Basin and would create equity problems with other urban settlements that draw water from the Basin for consumptive purposes.

However, the IAG recognises the need to develop a Cap for the ACT which is "fair and reasonable". To that end, the IAG has outlined its own proposal which addresses the six underlying principles used in setting a Cap for other parts of the Basin, and provides the ACT with access to additional water should it need such reserves and should these be available at the high level of security that the ACT requires. The IAG proposal factors into the proposed climate-adjusted Cap of 40 GL on net diversions, provisions for the supply of water to Queanbeyan, the offtake of water from Lake Burley Griffin by the NCA, efficiencies in the use of water achieved by the ACT over recent years, and the accumulation of credits from 1997 in the same way as is applied to other parts of the Basin using climate-adjusted Caps. The ACT will need to have any model that it uses in the administration of this Cap certified by an independent audit process, and agree to the reporting of diversion under the provisions of the Schedule F arrangements. With the proposed inclusion of the additional credits that have accumulated over the last 10 years, the Cap proposed by the IAG will provide the ACT with the ability to meet its future water needs while at the same time have a Cap that is determined and applied consistently with practices in other parts of the Basin.

The ACT has the licensing and administrative arrangements in place that will allow the reporting of its performance under the proposed climate-adjusted Cap. Implementation of the Cap should therefore not create any administrative difficulties but could take effect immediately with Cap credits being applied from 1997.

4.5.9 Conclusions/Recommendations

- The ACT has reaffirmed its commitment to establishing a Cap;
- A proposal from the ACT for a Cap linked to growth in population and arguing retention of certain rights under legislation establishing the Territory as the Seat of Government has been reviewed by the IAG but found not to meet the principles applied in setting the Cap for other parts of the Basin;
- The IAG recommends an alternative Cap proposal which provides for a 40 GL climate-adjusted Cap based on net diversions, and allowing for the retention of credits that would have been generated over the last 10 years had a Cap of this size been adopted at that time;
- Net diversions of 25 GL in 2006/07 are consistent with the average net diversion between 1989 and 2006 of 31 GL and are also less than a possible climate-adjusted annual Cap target of 51.2 GL. The ACT would have a cumulative credit of 107 GL if the Cap of 40 GL proposed by the IAG had applied since July 1997, although this may be reduced once allowance is made in the model for restrictions under dry conditions so that the model is consistent with those in other jurisdictions.

5. DIVERSIONS FROM THE MURRAY-DARLING BASIN IN 2006/07

Murray-Darling Basin diversions in 2006/07 totalled 5303 GL. This was the lowest annual diversion in the period since 1983/84 and was only 41% of the record diversion of 12964 GL in 1996/97. Diversions for the individual valleys in the Murray-Darling Basin are presented in Table 13. The diversions over the last five years constitute five of the lowest seven years of usage in the same 24 year period. Of the 24 years

since 1983/84, total Basin diversions in 2006/07 ranked 24; diversions in NSW ranked 24; Victorian diversions ranked 24, SA 7, Queensland 23 and the ACT 23. Of the total water diverted, New South Wales diverted 44%, Victoria 41%, South Australia 12%, Queensland 3% and the Australian Capital Territory 1%. Annual diversions since 1983 are plotted in Figures 1 and 2.

Table 13: Murray-Darling Basin Diversions in 2006/07

System	Total Diversion (GL)	Percentage of Basin Diversion (%)
New South Wales		
Intersecting Streams	3	0.1%
Border Rivers	135	2.6%
Gwydir	140	2.6%
Namoi/Peel	154	2.9%
Macquarie/Castlereagh/Bogan	238	4.5%
Barwon-Darling/Lower Darling	17	0.3%
Lachlan	66	1.2%
Murrumbidgee	950	17.9%
Murray	602	11.3%
Total NSW	2304	43.5%
Victoria		
Goulburn/Broken/Loddon cap valley	715	13.5%
Campaspe	8	0.2%
Wimmera-Mallee	17	0.3%
Murray/Kiewa/Ovens Cap valley	1466	27.6%
Total Victoria	2206	41.6%
South Australia		
Metro-Adelaide & Associated Country Areas	203	3.8%
Lower Murray Swamps	28	0.5%
Country Towns	41	0.8%
All other uses of water from the Murray River	356	6.7%
Total South Australia	628	11.8%
Queensland		
Condamine/Balonne	49	0.9%
Border Rivers/Macintyre Brook	69	1.3%
Moonie	10	0.2%
Nebine	0.08	0.0%
Warrego	13	0.2%
Paroo	0.02	0.0%
Total Queensland	140	2.6%
Australian Capital Territory	25	0.5%
Total Basin	5303	100.0%

Figure 1: Murray-Darling Basin Diversions – 1983/84 to 2006/07

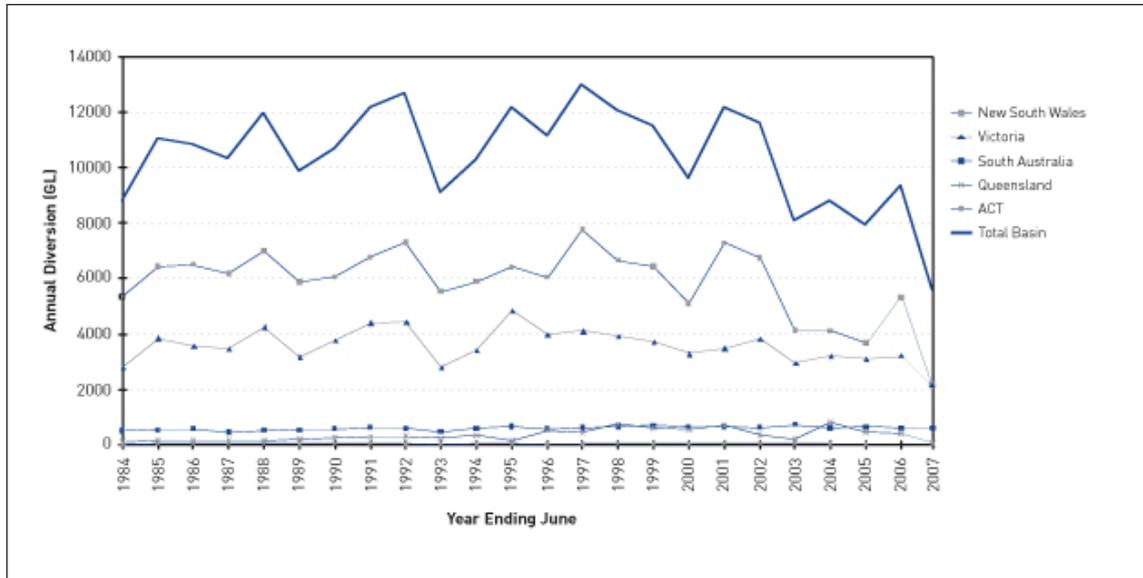
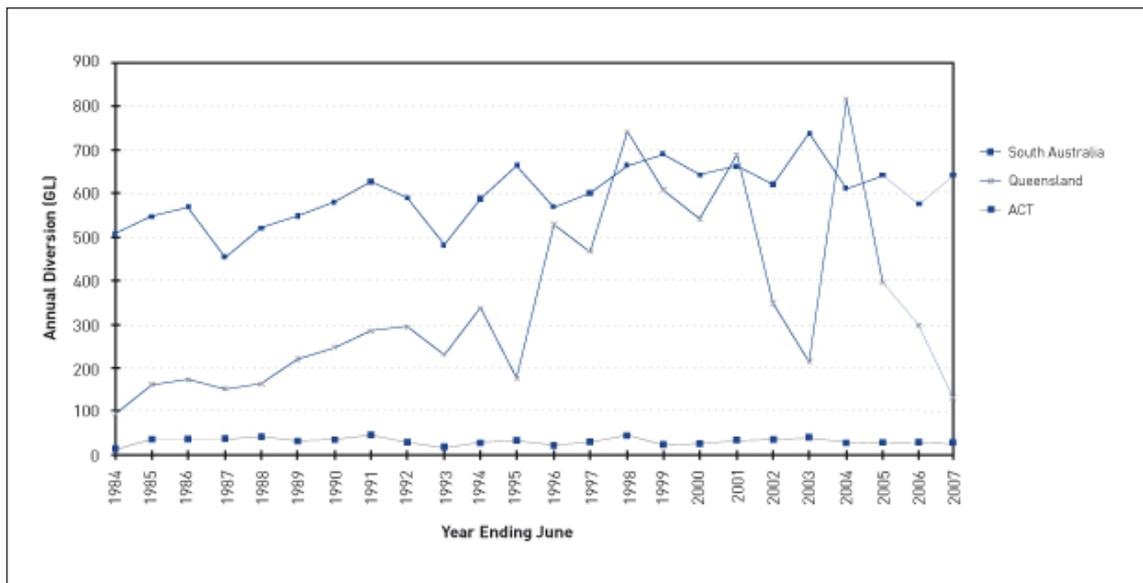


Figure 2: Murray-Darling Basin Diversions – 1983/84 to 2006/07 (Usage under 1000 GL/year)



APPENDIX A: 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 2006. The Council agreed to publish these responses as an appendix to the Independent Audit Group's Report.



South Australia remains committed to the Cap process and will ensure that long-term diversions are maintained within the Murray-Darling Basin Ministerial Council Cap on diversions. The IAG again confirmed that diversions for Metropolitan Adelaide and Associated Country Areas, Country Towns, Lower Murray Swamps and *All Other Purposes* were less than their respective Caps in 2006/07.

The 2006/07 water year saw unprecedented low inflow conditions into the River Murray systems and South Australia was faced with its lowest water availability since 1945. Local rainfall and inflows into the Mount Lofty Ranges were also well below average, placing significant pressure on constrained River Murray water resources. For the fourth consecutive year, restrictions on River Murray water users were required. South Australian River Murray water users were subject to 60% allocation for the entire year, although initially allocations were set at 80%. This reduction was required when, by October 2006, it was recognised that the inflows were substantially less than the previous minimum inflows and the predicted minimum flow to South Australia was less than that required to meet losses and the restricted diversions at 80% allocation.

A total of 627.9 GL was diverted, which was the fourth lowest since the Cap was introduced. Included in this volume was 60 GL that was pumped in advance for the 2007/08 water year because of the threat of deteriorating water quality.

The IAG report indicates that South Australia is in a good position to manage diversions within Cap and remains committed to improving the data management system. South Australia will continue work on development of a model to assess the growth for Metropolitan Adelaide and provide

recommendations to the IAG on a proposed method for dealing with growth, including accounting for this growth under the Cap. Demands placed on water resources management as a result of the prolonged extreme drought and difficulties in identifying how to account for annual restrictions under the 5-year rolling Cap have delayed the development of this work. This delay has in no way resulted in any suggestion of non-compliance with the Cap as growth has been covered by purchasing water. The water to account for growth is held on a "first use" licence accounted under the *All Other Purposes* Cap because the Metropolitan Adelaide Cap is non-tradeable.

South Australia remains committed to implementing initiatives to reduce its reliance on the River Murray for non-irrigation uses. Options currently include wastewater recycling, household restrictions, proposed expansion of the Mount Lofty Ranges storages and desalination.

The proposal that South Australia should develop a model to generate Cap targets using urban demand, Mount Lofty Ranges inflows and make allowances for urban water restrictions need clarification and further discussion. The contention that failure to implement this will generate artificial growth in Cap credits is not considered valid as the 5-year rolling Cap for Metropolitan Adelaide effectively limits the Cap "credit" to that accumulated during each rolling 5-year period.

The South Australian Government remains committed to the metering of diversions within the Lower Murray Swamps. It is anticipated that these diversions will be fully metered in 2008. Once completed, South Australia intends to submit a proposal to amalgamate the Lower Murray Swamps and *All Other Purposes* Caps.

South Australia agrees in principle that annual diversion targets should be adjusted to account for restrictions on allocations to ensure that inappropriate Cap credits are not generated by the implementation of restrictions. The concept of adjusting the Cap to reflect the final announced level of restriction is seen as appropriate but will require further development before it can be implemented.

Comments on other jurisdictions

South Australia is pleased that several Cap models have been submitted by NSW to the independent auditor for accreditation and that significant progress has been made in Queensland with the Resource Operating Plans and Cap figures set for the Warrego, Paroo and Nebine Catchments and the Moonie River.

The ACT has submitted a proposal for a Cap and South Australia is concerned that the proposal does not match the original principles of the "1996 Setting the Cap Report" or the more specific principles introduced in 2000 regarding Caps for urban use. The ACT proposed a population growth Cap, which is not consistent with any other Cap in the other jurisdictions. South Australia does not agree that the ACT has a strong case on equity grounds for a higher Cap than current usage because of past prudent water use and is supportive of the IAG's proposal that sets a climate-adjusted Cap of 40 GL based on net diversions.



VICTORIA

Victoria continued to implement the Cap on regulated systems by establishing Bulk Entitlements in accordance with the *Water Act 1989* and Streamflow Management Plans on unregulated streams. Low Reliability entitlements, equivalent to 120 GL of average use, were transferred to a number of environmental Bulk Entitlements within the Victorian portion of the Murray-Darling during 2006/07.

Annual Cap targets are estimated using hydrological models in accordance with the requirements of Schedule F to the *Murray-Darling Basin Agreement*. The accredited Cap model for Goulburn/Broken/Loddon and Campaspe Valleys was used to calculate the 2006/07 Cap targets and cumulative credits for these valleys. The Murray model has been recalibrated by MDBC and is currently being independently reviewed. This interim model has been used to calculate the 2006/07 Cap target and cumulative credits for the Murray/Kiewa/Ovens valley. A Cap model for the Wimmera Mallee valley is currently being developed.

Diversions since July 1997 from each of Victoria's four designated valleys continue to comply with the Cap.

Diversions from the Murray/Kiewa/Ovens valley and Goulburn/Broken/Loddon valleys were slightly above their Cap targets in 2006/07 and diversions from the Campaspe and Wimmera-Mallee valleys were below their targets.

Some uncertainty in this year's Cap target for the Campaspe valley has been identified as the extremely low water-resource situation has caused the Campaspe Cap model to operate well outside the hydrological conditions under which it was calibrated. Victoria proposes to improve the performance of the hydrological models where practicable. Improvements will include recalibration of loss relationships using recent hydrological data and system operational characteristics to simulate system performance in the recent severe drought.

Victoria remains committed to the provision of additional water for the environment and the reduction of the Cap when environmental flows are increased. The Victorian Cap will continue to be reduced as additional water is recovered under The Living Murray Initiative and the *Victorian Food Bowl Modernisation Project*.





NEW SOUTH WALES

The severe drought conditions, and the lowest inflows on record in some valleys, has forced significant changes to normal water management during 2006/07, and will also lead to further development of the river models' ability to simulate these climatic extremes. NSW supports the IAG recommendations to take into account the impacts of this drought, to ensure that the MDBMC Cap process continues to be robust.

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. NSW supports the formal recognition of "current conditions" modelling within the overall Cap process, together with the existing annual accounting process.

Again, the report indicates that diversions in all NSW valleys are currently within Cap, with the exception of the NSW Border Rivers, where a Cap is currently

being formalised, and the Barwon-Darling valley. NSW has implemented a new licensing framework in the Barwon-Darling valley that has restructured entitlements to water in the form of an average annual use that accords with the long-term Cap. This will ensure that future diversions cannot exceed Cap over the long-term.

NSW continues to make significant progress towards accreditation of valley models under Schedule F for Cap auditing, with both the Lachlan and Namoi valley models now accredited by the independent auditor. NSW has also presented the Gwydir, Macquarie, Murrumbidgee and Peel (a sub-catchment of the Namoi) valley Cap models to the independent auditor for accreditation. Accreditation of the remaining NSW Cap models for the Barwon-Darling and NSW Border Rivers is a priority for NSW, and they are expected to be submitted for accreditation before the next IAG review.



Queensland agrees with the IAG assessment and is pleased to note that the audit of the Warrego, Paroo, Nebine and Moonie catchments for the 2006/07 water year confirms that these systems have all been managed within Cap. The Cap arrangements are aligned with the Resource Operations Plan and provide annual seasonally-adjusted limits on take in each of the catchments.

Proposals for capping in the Border Rivers and Condamine and Balonne will be submitted to the MDBC within six months of completion of the relevant Resource Operations Plan.

The continuing drought conditions during the 2006/07 year provided limited diversion opportunity for Queensland with total diversions of only 140 GL, the lowest since detailed monitoring and reporting commenced in 1993/94. Management responses to the conditions included limitations and complete bans on access to water, with several town water supplies under threat and one failing. Water harvesting diversions, which generally make up the bulk of Queensland take, were limited to a total of only 32 GL, of which less than half was taken in the more developed catchments like the Border and Condamine and Balonne.





AUSTRALIAN CAPITAL TERRITORY

Water Use

The volume of gross diversions and net diversions for the ACT decreased significantly from 2005/06 and was in keeping with the trend since 2003. The volume of gross diversions and net diversions is the lowest on record (ie. since 1989/90). This trend is itself due to Government initiatives to restrain use of potable water and the necessary water management to facilitate water use in the prolonged drought. The decrease in diversions is largely due to the ACT consumption being constrained by compliance to Level 3 temporary water restrictions which have been applied since November 2006.

Cap

The ACT has this year submitted its Cap proposal to the Murray-Darling Basin Commission. The ACT Government continues to be committed to the implementation of an environmentally and economically sustainable Cap for the long-term water security of the ACT and to meet the objectives for water extractions from the Basin. The ACT has continued to exercise sound performance in environmental water management.

The ACT notes the IAG draft report on its Cap proposal and makes the following response to the IAG's assessment of the ACT's Cap proposal meeting the IAG's principles.

The IAG has noted the scope for population growth in the ACT Cap proposal is inconsistent with growth in Caps in other valleys of the Basin. The IAG's position can be described as assuming a "one methodology fits all" approach where Queensland, New South Wales, Victoria and South Australia have sparsely populated MDB zones with extensive agricultural use of water. However the ACT has a proportionally large population base with very minor agricultural use of water. Furthermore, the ACT has legislated guarantee of water resource access under the Seat of Government Act and other legislation including the *Canberra Water Supply (Googong Dam) Act* and the *National Capital Development Act*.

Accordingly the ACT's position is clearly different from other jurisdictions for a number of reasons and hence the proposed base for its Cap methodology is different. Those reasons are worth reiterating:

- The ACT has a negligible agricultural-irrigation sector which would be highly unlikely to greatly consume water and potentially contribute to an over-allocation problem;
- The volume of water consumed in comparison to most other parts of the Basin is very small at 0.3 % of the Basin. Concern over the application of the precautionary principle in respect to water allocations for the ACT seems misplaced given the volume of water used in the ACT. This is reinforced by a comparison of the quantity of water generated in the ACT;
- The ACT is principally an urban-administrative-service city with a steady and identifiable consumption pattern but one which is likely to grow steadily over time;
- The ACT was established largely as a city state. The location and general availability of water resources were to service the city's development. References to Adelaide and other urban centres in the Basin are not appropriate given the basis for the establishment of the ACT and the volume of water generated in the ACT which meets downstream water users;
- The IAG recognises the statutory rights of the ACT but without the need for a growth capacity created by Commonwealth legislation. However, the ACT is not seeking to extend its statutory rights as set by the Commonwealth for the growth of the national capital but to treat that statutory right as a ceiling to any potential growth over time and to establish a stringent regime consistent with IAG Principles for increased use of water as the population grows.

- A principle of the IAG is allocative efficiency. Allocative efficiency however can only be considered in the context of property rights and optimal economic use. The ACT proposal recognises the property rights inherent in the Commonwealth legislation and will see the water allocated to its highest efficiency. Moreover, the ACT is proposing a self restraint that supports efficiencies because it is proposing to not engage in water trading except for any water surplus to needs under the X-25% efficiency factor model. The fact that there is a growth factor does not remove allocative efficiency – the ACT’s proposed approach reinforces the principle of allocative efficiency.
- The IAG has not recognised the allocative efficiency built into the ACT Cap for commercial use of water. In keeping with its inbuilt restraint in its Cap proposal the ACT will require any new business/industry related growth to acquire water rights for transfer to the ACT. The ACT proposal has equal treatment of commercial use of water between agricultural and other industry for the ACT. This will see water moved to its new highest commercial values.
- The IAG has failed to address the issue of allocative inefficiency already inherent in the Basin where downstream of the ACT users seek to exert an allocative right over accessible water sourced from the ACT. Economically that water is applied to lower value users than otherwise possible upstream use. ACT water is currently priced at \$1.33 to \$3.12/kilolitre if more than 300 KL is used. MIA Internal water trades for September 2006 to February 2007 records show a minimum price of \$0.115/Kl and a maximum price of \$0.50. Average MIA price September 2006 to February 2007 was \$0.34/Kl.
- The IAG has proposed an alternative model that is based on and suited to an agricultural based system without consideration of the ACT’s unique circumstances and statutory rights in existence prior to development of the Cap system.

Other comments

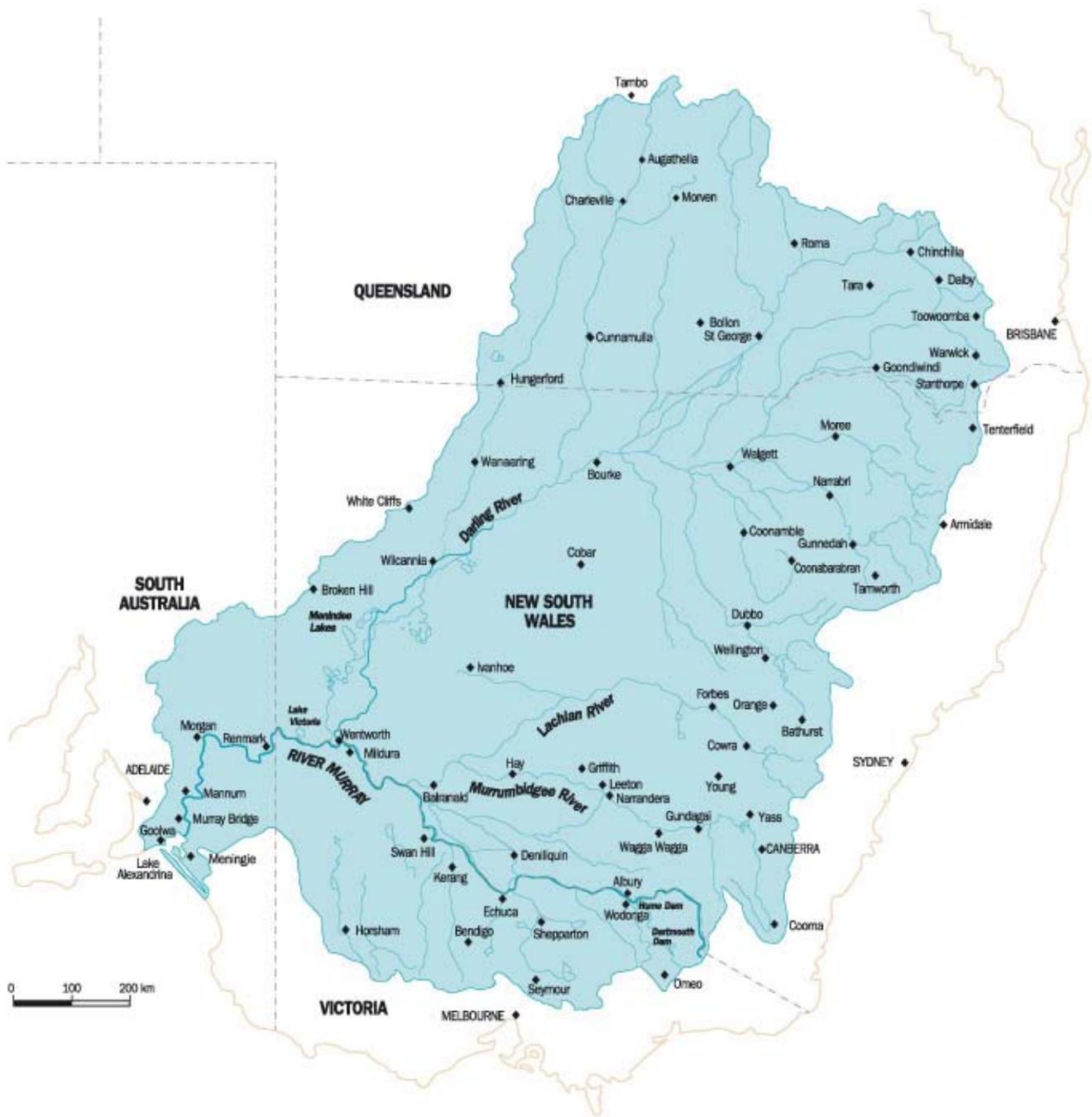
The ACT supports the need for the Commonwealth Government (and its agencies) to report its diversions from Lake Burley Griffin.



GLOSSARY

ACTEW	ACT Electricity and Water Corporation.
announced allocation	The percentage 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 <i>Water Act 1989</i> .
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.
DNR	The Department of Natural Resources (of NSW).
DNRMW	The Department of Natural Resources Mines and Water (of Queensland).
DSE	The Department of Sustainability 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 10 ⁹ litres.
GL	Gigalitre: one thousand million or 10 ⁹ 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.
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 <i>Agreement</i> between the Governments of the four Basin States and the Commonwealth. The current Agreement is the <i>1992 Agreement</i> .
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 percentage 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 <i>Water Act 2000</i> for allocating water between consumptive use and the environment.
WSP	Water Sharing Plan. Plans developed under the New South Wales <i>Water Management Act, 2000</i> for equitable sharing and management of NSW water resources.
WUE	Water Use Efficiency.



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