Australian Government

MURRAY–DARLING BASIN AUTHORITY

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Review of Cap Implementation 2009–10

Report of the Independent Audit Group

October 2010

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Report of the Independent Audit Group

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October 2010

Acknowledgements

The Independent Audit Group appreciates the cooperation of state and territory government agencies and the Murray–Darling Basin Authority.

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

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Auditors' foreword

October 2010

Dear Mr Freeman

Attached is our report *Review of Cap Implementation 2009–10: Report of the Independent Audit Group.*

The Murray–Darling Basin Ministerial Council established the Cap in 1995 and set the operating framework in 1996.

We are pleased to advise that, for all valleys for which Caps have been established, there has been no exceedence of the Cap trigger.

The states and Australian Capital Territory continue to progress Cap implementation with Cap proposals received by the Murray–Darling Basin Authority (MDBA) for the New South Wales Border Rivers and Condamine–Balonne. This only leaves Cap proposals to be submitted for the Barwon–Darling and the New South Wales border Intersecting Streams.

Model development and accreditation also continues and 2010–11 should see models for all major valleys either approved or submitted for audit and accreditation.

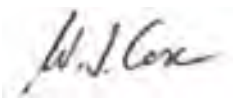
The availability of environmental water in 2009–10 highlighted the need to implement Cap adjustments for environmental water and the IAG supports the Victorian proposal for Cap adjustment and recommends its application to other states and the Australian Capital Territory.

This year's early audit placed considerable pressure on some states to produce information on diversions and Cap targets. Their cooperation was appreciated by the IAG as this timing reflects the need to meet Ministerial Council requirements.

The IAG wishes to put on record the cooperation of state and Australian Capital Territory officers and the assistance of MDBA staff.

The audit was done in a spirit of cooperation while recognising the right of the IAG to form its own conclusions and recommendations.

Yours sincerely



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Chairman

PAUL BAXTER
Member

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Member

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Executive summary

The Murray–Darling Basin Ministerial Council adopted Schedule E to the Murray–Darling Basin Agreement to operationalise, monitor and report on Cap implementation. This audit was conducted in line with the requirements of clause 15 to the Schedule.

At 5,472 GL, diversion from rivers in the Murray–Darling Basin was the fourth lowest since 1983–84, reflecting continuing severe drought conditions throughout most of the Basin. While higher than the record low of 4,119 GL in 2008–09, the results for 2009–10 continue the recent pattern of low diversions.

All valleys were within Cap targets in 2009–10 and no valley exceeded the trigger for a special audit.

The 2009–10 audit identifies important progress in each of the states and the Australian Capital Territory in establishing and/or implementing the Cap. The key developments or issues are:

- Caps have now been set or proposed for all valleys except for the New South Wales Intersecting Streams.
- A Cap proposal has been received for the New South Wales Border Rivers and assessed by the IAG (see *New South Wales Border Rivers Cap proposal: IAG assessment*).
- Following implementation of the resource operations plan for the Condamine–Balonne in Queensland, a Cap proposal has been submitted.
- Models have been developed for 21 of the 22 valleys for which they are required. Sixteen have been submitted for audit with 13 audited (see **Appendix B**).
- Recalibration to better model extreme conditions and management responses not experienced during the period over which the models were calibrated continues.
- Action continues to develop climate-adjusted models (and population-adjusted for Australian Capital Territory) for Metropolitan Adelaide and the Australian Capital Territory. These are expected to be submitted in 2010–11.
- Cap models for the New South Wales Border Rivers and Queensland Condamine–Balonne are expected to be submitted for assessment and accreditation in 2010–11 following finalisation of caps.

The resource operations plan (ROP) for the Condamine–Balonne was finalised in 2010. Queensland had previously committed to submitting a Cap proposal no later than six months after the resource operations plan was in place. Queensland submitted its Cap proposal to the Murray–Darling Basin Authority (MDBA) in October 2010, and it will be assessed by the IAG before consideration by the Ministerial Council. When finalised, Cap setting for all the Queensland valleys will be completed, although the IAG notes that a number of water resource plans/resource operations plans will be reviewed to further clarify and refine operations.

New South Wales submitted its Border Rivers Cap proposal and once finalised only the Intersecting Streams will remain without Caps. New South Wales advised that its macro-planning project on Intersecting Streams is likely to be completed allowing a Cap for these streams to be specified by the end of 2010–11.

Development of Cap models continues and the IAG notes progress for a climate-adjusted model for Metropolitan Adelaide and a climate/population-adjusted model for the Australian Capital Territory. Timely finalisation in 2010–11 will provide a more appropriate basis for assessing Cap compliance in these valleys.

The IAG also notes that Queensland and New South Wales are set to submit Cap models for the Condamine–Balonne and Border Rivers respectively once caps have been set for those valleys. This will provide the basis for setting annual Cap targets for monitoring Cap compliance.

The IAG could not fully assess Cap compliance for the Queensland Border Rivers as there have been resource constraints in completing the necessary modelling. This is unfortunate and the issue needs to be addressed to ensure no recurrence in future years.

Differences in interpreting the Ministerial Council decision of 23 May 2008 and Schedule E to the Murray–Darling Basin Agreement (Schedule 1 of the *Water Act* 2007) in regard to the Australian Capital Territory Cap have become apparent between territory officials and the MDBA. If these differences cannot be resolved, the IAG recommends that a submission be made to the Ministerial Council.

The drought and associated low-flow conditions have resulted in a number of operational changes, which have not been incorporated in the models used to set Cap targets. The IAG proposes to prepare a separate paper to address the generic issue of drought/low-flow impacts on models and Cap targets, and to establish principles to guide decisions when there is likely to be an impact on the Cap.

For the 2009–10 water year audit, the IAG's requirements have again necessitated bringing forward the reporting timing for each of the states and the Australian Capital Territory. The IAG is required to complete its report to the MDBA in time to allow its findings to be presented to the December 2010 Ministerial Council meeting.

The IAG is aware that the requirement for earlier reporting stems from a report to the MDBA on an 'Independent review of imbalances in water use' under the Murray–Darling Basin Agreement, which among other things, recommended that the period for closing-off water accounts after the end of the water year be progressively reduced each year until that closure is achieved within one or two months of the end of the water year. The IAG understands the need for more timely reporting of Cap compliance and of water reporting more generally, particularly given the development of a national water accounting framework based largely on the analogy with financial accounting and reporting.

In bringing forward the timing of the audit, the IAG has been conscious that there are likely to be implications for operational practices and the timeliness of updating of the Cap models and reporting water diversions for individual jurisdictions.

However, given the need to meet the Ministerial Council requirements, the IAG recommends that the 2011 audit be conducted again in the last week of September with diversion reports to be forwarded to the IAG in the third week of September and that the reporting time schedules be kept under review.

In summary, the detailed conclusions and recommendations reached by the IAG for 2009–10 by state and territory are:

South Australia

- Diversions in 2009–10 were 480 GL compared to diversions of 485 GL in 2008–09.
- Diversions in 2009–10 continue to be constrained as a result of restrictions due to ongoing drought conditions and are well within the annual Cap targets for Metropolitan Adelaide, Country Towns, Lower Murray Swamps and All Other Purposes Cap valleys.
- South Australia has a reliable measurement system for urban and irrigation uses.
- The IAG notes that an allowance for water restrictions has been calculated in the annual diversion targets. This is the second year that such an allowance has been made, and is now embedded in the process.
- The South Australian 'All Other Purposes' Cap model was approved by the MDBA in November 2004 and the climate–adjusted Cap for 2009–10 was adjusted down to account for water restrictions in the latest year.
- The IAG notes that an adjustment for the use of The Living Murray (TLM) water recovered in South Australia has been allowed in the 2009–10 Cap reporting by South Australia, and that the transfer of environmental water from interstate has been excluded from the temporary trade adjustment.
- The IAG notes the methodology used to estimate diversions in the Lower Murray Swamps. The IAG understands that this has been necessary due to the difficulty in accessing meters and associated safety concerns. The IAG believes that South Australia has adopted an appropriate methodology for such circumstances.
- The IAG has previously recommended that South Australia develop a climate–adjusted model of diversions from the River Murray for Metropolitan Adelaide. It notes that the finalisation of the model has been delayed due to technical issues. It understands that the model should now be submitted for accreditation, and subject to approval, used for the 2010–11 year.
- South Australia has provided an analysis of the proposed amalgamation of remaining Lower Murray Swamps Cap components with the All Other Purposes Cap, while retaining the environmental land management allocation

(ELMA) as a non-tradeable component within the All Other Purposes Cap. The IAG supports the amalgamation, subject to clear reporting each year to ensure the environmental land management allocation continues to be applied to the Lower Murray Swamps. The IAG notes that an amendment to Schedule E is required and a submission will be made to Ministerial Council during 2010–11.

Victoria

- Diversions in 2009–10 were 1,810 GL compared to 1,503 GL in 2008–09.
- Diversions for the Murray/Kiewa/Ovens, Campaspe, Goulburn/Broken/Loddon and Wimmera–Mallee valleys in 2009–10 were below annual climate, environmental use and trade-adjusted Cap targets.
- Cumulative diversions since 1997 are in credit for all valleys.
- Victoria has accredited models for all valleys except the Wimmera–Mallee. A model has been submitted for accreditation and a decision is expected in 2010–11.
- Model modifications (approved) and changed inputs have resulted in changes to Caps and Cap credits for previous years.
- The updated models have been used to calculate 2009–10 Cap targets and the cumulative credits presented.
- Victoria has proposed to the MDBA a method for adjusting Caps on diversions for environmental entitlements and has applied this methodology to account for water recovered for the environment through initiatives such as The Living Murray. It is expected to be approved in October 2010.
- The IAG notes that Victoria proposes further refinements to the Cap including an entitlement for the environment to recognise historical use of water taken from unregulated flows. This would be subject to MDBA approval.
- Victoria continues to apply itself to the successful implementation of, and compliance with, the Cap.

New South Wales

- Diversions in 2009–10 were 1,932 GL compared to 1,729 GL in 2008–09.
- Cap models have been approved for five New South Wales valleys and are currently being audited for two of its remaining four valleys.
- Cumulative Cap credits exist for all valleys in New South Wales with the exception of the Barwon–Darling, although for the combined Barwon–Darling and Lower Darling valley, a cumulative Cap credit exists.
- On the basis of preliminary modelling data, the Barwon–Darling/Lower Darling valley does not appear to have exceeded the trigger necessitating a special audit. Pending the formal consideration and accreditation of the Barwon–Darling model, it is not possible for the IAG to say that the long-term trend in diversions on the Barwon–Darling has been addressed, and accordingly New South Wales is encouraged to submit this model for accreditation as soon as possible and thereby allow full transparency of the results it generates.
- The IAG has been unable to assess the Cap compliance of the New South Wales Border Rivers because a Cap has still not been set; however, a Cap proposal for the Border Rivers along with an allowance for the enlarged Pindari Dam has been submitted for IAG assessment and is discussed further in a separate IAG report, *New South Wales Border Rivers Cap proposal: IAG assessment, October 2010.*
- New South Wales is encouraged to complete the process of having the Macquarie and Murrumbidgee Cap models reviewed and accredited for use under Schedule E by the end of 2010 to allow these models to be formally used for the 2010–11 audit review.
- Water sharing plans, the main instrument used by New South Wales to ensure compliance with the Cap at a valley level, continue to be suspended for the New South Wales Murray, Lower Darling, Murrumbidgee, Lachlan, and Macquarie/Cudgegong valleys. However, it is likely that this suspension will be lifted in 2010–11 given the improved rainfall and outlook in late 2009–10.
- New South Wales will need to advise on the timing for the proposed capping of unregulated streams, given that the macro-planning project on Intersecting Streams is likely to be completed by the end of 2010–11.

Queensland

- Total diversions in 2009–10 were 1,229 GL compared to 383 GL in 2008–09.
- The total includes 831 GL of stream diversions and an estimated 398 GL of overland flow harvesting.
- Above average rainfall in the western valleys resulted in flooding and end-of-system flows of 6,242 GL compared to 391 GL in 2008–09.
- Caps are set for all Queensland valleys, except for the Condamine–Balonne. However, Cap targets for 2009–10 were only available for Warrego, Paroo, Nebine and Moonie, which were all below the relevant Cap targets.
- Cap targets are unable to be calculated for the Border Rivers Valley (as of September 2010) as the hydrologic model for the catchment is shared between Queensland and New South Wales and a collaborative effort to extend the model is unable to be scheduled until late 2010.
- As a consequence, the IAG cannot form a view as to the compliance (or otherwise) with Cap targets for the Queensland Border Rivers.
- The IAG recommends that for the Border Rivers:
  - a supplementary (desktop) audit be done when the collaborative modelling is completed late in 2010, and
  - a protocol be developed so that both New South Wales and Queensland are 'fully aware of the requirements and commitments of the other State'.
- A Cap proposal for the Condamine–Balonne has been presented to the IAG and submitted to the MDBA.
- A project is being progressively rolled out as part of a Queensland-wide project to meter all entitlements. The project will ensure reliable information on water use is available as the resource operation plans are implemented.

Australian Capital Territory

- Net diversions of 20.5 GL were well below the long-term diversion Cap target of 40 GL.
- Progress has been made towards including the Commonwealth diversions in those reported by the Australian Capital Territory. The IAG understands that this matter will be finalised and the reporting requirements met during 2010–11.
- The IAG welcomes progress on the development of a model for calculating a climate-adjusted Cap, and its submission for auditing and accreditation in October 2010.
- The IAG notes that the model developed also incorporates adjustments to the Cap for population growth as part of the finalisation of the climate-adjusted model to be used to administer the Cap.
- The Australian Capital Territory and the MDBA need to resolve the outstanding interpretive differences between the Ministerial Council decision of 23 May 2008 and Schedule E to the Murray–Darling Basin Agreement (Schedule 1 of the *Water Act* 2007). Should the matter not be resolved, the IAG recommends that a submission be made to the Ministerial Council.

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 E[1] , agreed that the IAG should have a role in auditing the implementation of the Cap.

In March 2005 the former Murray–Darling Basin Commission agreed to continue the role of the IAG in auditing Cap compliance.

In 2006, Council requested that the IAG also audit The Living Murray initiative. The Living Murray audit is set out in a separate report, *Audit of The Living Murray implementation 2009–10*.

The Council 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 New South Wales, was due to be completed about the middle of 1998 and, despite some delays, is now nearing completion. 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 2009–10* 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 Australian Capital Territory. The report sets out the background to the review and the process used by the IAG in forming its views and final conclusions.

It 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 Queensland's Condamine–Balonne and New South Wales Border Rivers and Intersecting Streams still need to be established.

The IAG team wishes to acknowledge and thank all states and the Australian Capital Territory for their cooperation in making both the data and officers available, and for the open and frank way in which the review was conducted. The IAG also wishes to acknowledge the assistance provided by the officers of the MDBA in preparing this report. The findings, however, are entirely those of the IAG.

[1]This was previously Schedule F to the Murray–Darling Basin Agreement [the agreement] before the amendment to the *Water Act 2007* in 2008, where an amended agreement was appended to the *Water Act 2007*.

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 use 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 Australian Capital Territory, the Cap will be defined following a review by the IAG and negotiations with the Australian Capital Territory Government
- 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) process being undertaken by that state, the outcome of which will be considered by the Council.

For Queensland, the Council agreed that the water resource plans process should ensure that Queensland balances consumptive and instream use. The IAG has supported the water resource plan process noting that:

- it must accommodate instream 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 water resource plan be fully implemented, including assessment of downstream impacts in New South Wales
- the precautionary principle be applied by establishing an allocation to be held in reserve to minimise the risk of over-allocation for consumptive use, and
- the final independent audit of the water resource plans process is conducted, including modelling of impacts on downstream Basin flows.

After considering a number of equity issues, the IAG previously advised 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 Intergovernmental 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 changes in setting and modifying Cap targets to reflect water saved and/or purchased for environmental use.

The 2008–09 review of Cap implementation identified that:

- At 4,119 GL, diversion from rivers in the Murray–Darling Basin was the lowest since 1957, reflecting continuing severe drought conditions throughout most of the Basin. The results for 2008–09 continue the recent pattern of lowest diversions on record for the Basin.
- Diversions in South Australia in 2008–09 were 485 GL and were again constrained as a result of restrictions due to ongoing drought conditions and were within the annual Cap targets for Metropolitan Adelaide, Country Towns, Lower Murray Swamps and All Other Purposes Cap valleys.
- Diversions in Victoria in 2008–09 were 1,503 GL compared to diversions of 1,556 GL in 2007–08.
- Diversions for the Campaspe, Goulburn/Broken/Loddon and Wimmera–Mallee valleys were below annual climate, environment use and trade-adjusted Cap targets.
- Diversions for the Murray/Kiewa/Ovens valley were slightly above the annual Cap target for the year but below the level for a special audit.
- Diversions in New South Wales in 2008–09 were 1,729 GL compared to 1,466 GL in 2007–08.
- Including overland flow harvesting, the total diversion from the Queensland section of the Murray–Darling Basin was 383 GL in 2008–09.
- Net diversions of 18.7 GL for the Australian Capital Territory in 2008–09 were well below the Cap target of 29.7 GL.
- The preliminary Schedule E accounting for 1997–98 to 2008–09 period indicates that the cumulative actual diversions in the combined Barwon–Darling/Lower Darling Cap valley are 186 GL above the cumulative annual diversions targets and also above the trigger for a special audit of 62 GL, being 20% of the average annual long-term diversion Cap.
- For states and territories participating in or benefiting from environmental water improvement programs such as The Living Murray and the Commonwealth buyback, methods for Cap adjustment of environmental water entitlements, allocations and use will need to be developed, agreed with the MDBA and applied in future Cap reporting.
- The IAG supports the Victorian proposal to issue licences and make appropriate Cap adjustments as part of its Dairy Shed Water Licence Transition Program (for unregulated surface water systems) and Crown Frontage Riparian Program (licence in lieu of private right for water for stock directly from the stream).
- Cap figures for Queensland Murray–Darling Basin valleys have now been set for the Warrego, Paroo, Nebine catchments, the Moonie River and the Queensland component of the Border Rivers, and diversions within these systems have all been found to be within the annual diversion targets.
- The resource operations plan and the Cap for the Queensland part of the Border Rivers have been finalised and Queensland has reported against the Cap for this valley in 2008–09.
- A resource operations plan for the Condamine–Balonne system is expected to be finalised during 2010 once a legal challenge has been resolved. Queensland expects to submit the Cap proposal within six months of finalising the plan.
- The Australian Capital Territory also needs to bring forward its proposed mechanics for reporting growth in demand by industry and adjustments to the Cap for population growth as part of finalising the climate-adjusted model to be used to administer the Cap.

The IAG made a number of recommendations in the 2008–09 Cap audit report. Many of these recommendations related to the modelling that has been undertaken and the need to update and recalibrate these models to maintain the integrity and the reliability of the Schedule E accounting for Cap performance reporting.

The IAG has addressed a number of these modelling issues in previous reports. The following provides a broad summary of recommendations that have been made over the last seven years, and briefly notes the action that has been taken in response to the recommendations from the IAG.

Recommendation	Action taken
2008–09	
South Australia should remove from the All Other Purposes Cap the 50 GL transferred from interstate for purposes of meeting environmental needs in the Lower Lakes.	Completed.
For states and territories participating in or benefiting from environmental water improvement programs such as The Living Murray and the Commonwealth buyback, methods for adjusting the Cap for environmental water entitlements, allocations and use will need to be developed, agreed with the MDBA and applied in future.	Agreed in principle. Victoria submitted a proposed protocol which is expected to be approved in October 2010.
Upon completion of the integrated 1993–94 and current conditions model for the Border Rivers, New South Wales should submit the proposed Cap for that system for the IAG to assess the appropriate allowance for the enlarged Pindari Dam.	New South Wales has submitted a proposal for a Cap for its Border Rivers. This proposal is being assessed concurrently with the 2010 audit.
New South Wales needs to advise the timing and arrangements for the proposed capping of diversions on unregulated streams.	Advice has been provided and is covered in this report.
The Australian Capital Territory needs to include all surface and groundwater diversions in the reporting of 'other diversions' under the agreed Cap.	Australian Capital Territory agreed to report on all diversions but differs on the interpretation of its Cap including groundwater.
The Australian Capital Territory needs to bring forward its proposed mechanism for reporting growth in demand by industry and adjustments to the Cap for population growth as part of finalising the climate-adjusted model to be used to administer the Cap.	Work is progressing and a model is expected to be submitted to the Authority in 2010–11.
Finalisation of the Condamine–Balonne resource operations plan together with the valley Cap and Cap model.	The resource operations plan was finalised in 2010 and a Cap proposal was submitted to the Authority October 2010.

2007–08	
Action is still required to update models to address concerns regarding data input and its continuing relevance in a period of unprecedented drought conditions across the Basin, and to adjust Cap credit calculations for the impact of water restrictions on water diversion outcomes.	Some adjustments have been made to models for South Australia and Victorian valleys. Other states are still to address this issue, although the issue is more critical for the New South Wales valleys.
South Australia to develop a climate-adjusted model for Metropolitan Adelaide diversions.	Work has commenced on this modelling and is expected to be completed in 2010.
New South Wales to submit its current conditions modelling for independent audit given the relevance that is placed upon these models for reporting performance against the Cap.	New South Wales contends that this is not used for Cap compliance — this is for information only.
Treatment of diversions via the Goldfields Superpipe in Victoria to be standardised.	The IAG recommendation has been adopted.
Commonwealth and Australian Capital Territory to take action to allow reporting of Commonwealth diversions within the territory.	Discussions between the Australian Capital Territory and the Commonwealth are expected to be finalised in 2010–11.
Cap model and Cap estimate to be provided for the Border Rivers.	Queensland Border rivers Cap finalised. New South Wales has submitted the Cap proposal for its component of the Border Rivers.
Finalisation of the Condamine–Balonne resource operations plan together with the valley Cap and Cap model.	The resource operations plan has been finalised and a Cap proposal has been submitted to MDBA.
2006–07	
To ensure consistency, all Cap models used to calculate annual diversion targets as required by Schedule E, should incorporate mechanisms to account for water restrictions.	See comment above. This recommendation will be reported upon in future years against updated recommendations on this issue.
South Australia to develop a model of diversions from the River Murray for Metropolitan Adelaide to be accredited by June 2009.	See comment above.
An allowance for water restrictions be included in the calculation of the annual diversion targets for Metropolitan Adelaide, Country Towns, the Lower Murray Swamps and the All Other Purposes licence.	Completed. See comment above for the Metropolitan Adelaide Cap model.
The Mulwala loss allowance should not be subtracted from the New South Wales Murray Cap diversion under the current rule. Should the Council choose to change the rule by amending the register of diversion definitions to allow the Mulwala loss allowance subtraction, the Council should give prior consideration to the consequences of the decision on the integrity of the Cap.	Council has not yet decided to allow the Mulwala loss allowance to be deducted from the New South Wales Murray Cap diversion. An Authority committee has recommended it do so. In the meantime, the Mulwala loss allowance is not being deducted.
Upon completion of the integrated 1993–94 and current conditions model for the Border Rivers, New South Wales should submit the proposed Cap for that system for the IAG to assess the appropriate allowance for the enlarged Pindari Dam.	New South Wales has submitted a proposal to the MDBA.

2005–06	
All models be audited and accredited with modified targets for completion by June 2007 for the Murray and Lower Darling (MDBC), July 2007 for Victoria and New South Wales, and on completion of the resource operation plans by Queensland and before establishing a Cap for the Australian Capital Territory.	Out of 24 Cap valleys, the Cap has been defined for 21 valleys with Caps still to be defined for the Intersecting Streams, New South Wales Border Rivers and Condamine–Balonne. Cap models have been approved for eight valleys and 13 have been audited (see **Appendix 1)**.
Ministerial Council: i. note that skills shortages are affecting the rate of water reform implementation, including finalisation of Cap implementation, and ii. develop a strategy in partnership with other stakeholders to attract additional skilled resources into the water sector for both the short and long-term.	Skill shortages are still evident in some jurisdictions.
South Australia develop a model of diversions from the River Murray for Metropolitan Adelaide.	See comment above.
Treatment of the Mulwala loss allowance.	See comment above.
Treatment of Pindari Dam.	See comment above.
Queensland will place a proposal for Cap figures for each valley before Council before finalising the statutory process.	Cap proposal for all catchments with exception of Condamine and Balonne have been presented to Council via the IAG. In future years this item will be reported against more recent recommendations on this matter.
2004–05	
The Australian Capital Territory, New South Wales and Queensland governments finalise their Cap arrangements as a priority to provide confidence that there is accountability and transparency in performance against Ministerial Council objectives for the Murray–Darling Basin river systems.	Caps have now been agreed for the Australian Capital Territory, all New South Wales valleys except the Border Rivers and the Intersecting Streams, and all Queensland catchments with the exception of the Condamine and Balonne. In future years this item will be reported upon against more recent recommendations on this matter.
Audit and accreditation of all models with modified targets of July 2006 for Victoria and New South Wales (except for Border Rivers by June 2007) and December 2007 for Queensland.	See comment above.
Treatment of Pindari Dam.	See comment above.

2003–04	
Queensland and New South Wales finalise the Intergovernmental Agreement and establish the framework to enable Cap targets to be established for the Border Rivers.	Intergovernmental Agreement (IGA) formally signed and Queensland Border Rivers Cap now approved by Council.
South Australia and Victoria have all models accredited by 30 June 2005, New South Wales by June 2006 and Queensland by June 2007.	See comments above.
Upon completion of the integrated 1993–94 and current conditions model for the Border Rivers, New South Wales should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam.	See comments above.
2002–03	
A Cap still needs to be finalised for the New South Wales Border Rivers and the IAG recommends that in cooperation with Queensland, environmental flow rules and water sharing be finalised and a Cap determined in 2004. This also requires a submission from New South Wales on an appropriate allowance for the Pindari Dam.	See comment above.
The IAG recommends that each state and the Australian Capital Territory, where relevant, submit valley models for independent verification with a view to 50% of the models being accredited by 30 June 2004 and 100% compliance by 30 June 2005.	See comment above.
The IAG recommends that the only way to accommodate real growth in demand for Metropolitan Adelaide is to acquire additional water by way of permanent trade. This water could be by way of a separate licence and would be the first water used, thereby retaining the integrity of the original Cap target of 650 GL rolling average over five years.	See comment above.
Upon completion of the integrated 1993–94 and current conditions model for the Border Rivers, New South Wales should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam.	See comment above.

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3. Audit process

For the purposes of the 2009–10 Cap implementation audit, the IAG has adopted a consultative approach designed to:

- clarify expected Cap outcomes where relevant for each state
- gather available statistical information on actual levels of diversions in 2009–10 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 in finalising or implementing the management rules
- update the status of the Queensland water resource plans and finalise Cap figures for Queensland and the Border Rivers in New South Wales.

The IAG met with representatives from each of the states, the Commonwealth and the Australian Capital Territory during the period 27 September to 1 October 2010. Water usage in 2009–10 was compared with Cap targets and progress in establishing models and management frameworks to achieve targets were discussed, along with issues of possible concern.

For the southern Murray–Darling Basin states (New South Wales, Victoria, South Australia), the Australian Capital Territory and Commonwealth, the IAG also discussed progress in implementing The Living Murray initiative. The results of these discussions are reported separately in the *Audit of The Living Murray implementation 2009–10.*

The IAG drafted its observations and conclusions on progress being made within each jurisdiction. It then invited the states and the Australian Capital Territory to make factual comments on its findings, which were considered by the IAG before finalising the report.

While acknowledging the valuable contribution made by each of the states, the Australian Capital Territory, the Commonwealth, and MDBA staff, the findings and conclusions presented in this report are entirely those of the IAG.

4. Audit Of 2009–10 Cap Implementation

4.1 South Australia

4.1.1 The Cap

As a result of decisions of Ministerial Council in December 1996 and March 2001 and the amendment of Schedule E in March 2008, 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 94.2 GL per year for the Lower Murray Swamps with the following components —
  - 72 GL per year for swamp use with unrestricted trade
  - 22.2 GL per year non-tradable environmental land management allocation
- an average of 449.9 GL per year for 'All Other Purposes' in South Australia which is fully tradable, including 9.3 GL per year for what was previously the highlands associated with the Lower Murray Swamps.

A Cap model for the All Other Purposes approved by the Murray–Darling Basin Commission (now Authority) is used to determine the annual climate-adjusted Cap target for this category of diversion.

In years where water restrictions apply to entitlement holders the Cap will be adjusted to reflect this restriction. The 2009–10 Cap assessment includes an allowance for the final level of allocation, 62%, announced in March 2010.

South Australia has progressed a number of the actions identified by the IAG in its 2008–9 report. Work has been undertaken to amalgamate the All Other Purposes and Lower Murray Swamp Cap valleys, including provisions for annual restrictions for the new combined valley and also the Country Towns Cap. An adjustment for the 50 GL of environmental water for managing acid sulfate soils in the Lower Lakes is included in the combined All Other Purposes and Lower Murray Swamps Cap. A proposal will be submitted to the MDBA in October 2010 for formal approval of relevant components.

Work is still progressing on the new climate-adjusted model for Metropolitan Adelaide and Associated Country Areas. A number of technical issues need to be resolved before the model is submitted for accreditation and subsequent use during the 2010–11 audit. These include calculating annual inflows into Mount Lofty Ranges' storages, average annual extraction limits, environmental water provisions, and calculation of the annual climate-adjusted Cap target to represent the 2000 levels of demand.

4.1.2 2009–10 usage

Overview

In response to low water availability, South Australia and partner governments, agreed to implement special arrangements (Tier 2 sharing arrangements) for the sharing of water resources between the states at the beginning of 2009–10. This included using water from the shared resource and state-owned tributaries to provide, in order, conveyance water, critical human water needs, private carryover and a 25 GL allocation for each state. A number of contingency measures were identified but were not required due to sufficient early season improvements. Advances were again made by the implementation of the Tier 2 sharing arrangements and South Australia was required to repay the advances at a rate of 50% of improvements until all advances were repaid by mid-October 2009. From this point, South Australia received 100% of its improvements from the shared resource. South Australia came out of special accounting with New South Wales and Victoria in late 2009–10 due to improvements in Menindee Lakes and the River Murray being sufficient for each state to have 1,250 GL in reserve by the end of May 2010.

A number of trade and account adjustments were also undertaken to give effect to decisions of the Basin Officials Committee.

South Australia did not purchase water for irrigation purposes during 2009–10, as agreed with partner governments.

The volume of water available to South Australia at the start of the 2009–10 water year was again low, due to ongoing low inflows and limited improvements during 2008–09. The environment continued to suffer from the prolonged period of reduced water availability, in particular the floodplain, lakes Alexandrina and Albert and the Coorong. No freshwater releases occurred from Lake Alexandrina. Lake Albert and the

Goolwa Channel remained disconnected from Lake Alexandrina to prevent acidification. However, both areas received water via pumping.

The flow to South Australia at the start of 2009–10 was significantly constrained, and between July and December 2009 only 60% of the normal entitlement flow for that period was delivered due to low water availability. By January 2010, South Australia was able to take full entitlement flows for the remainder of 2009–10. This was due to improvements in the River Murray system and Darling River inflows.

A total of 1,690 GL flowed to South Australia, which included significant volumes of water for managing water levels in lakes Alexandrina and Albert and the Goolwa Channel. An inflow of 881 GL was delivered to Lake Alexandrina and this comprised a mix of water from different sources, including:

- 100 GL from the initial Menindee Lakes release under the Basin Officials Committee agreement
- 20 GL of Commonwealth Environmental Water Holder
- 170 GL (120 GL + 50 GL) committed by South Australia (the 50 GL was secured during 2008–09 and the Cap was adjusted to remove this volume)
- 350 GL of dilution and loss flow committed by South Australia
- 47.8 GL of Living Murray water, and
- 213 GL of entitlement flow.

The water level in Lake Alexandrina improved from a low of minus 0.93 m AHD in January 2010 to minus 0.3 m AHD by the end of May 2010 following delivery of large volumes of water to aid recovery.

Significant restructuring of irrigation areas in the Riverland continued in response to low commodity prices and incentives for irrigators to exit the industry. A condition of participating in the Small Block Irrigators Exit Grant Package, which closed for new applications on 30 June 2009, was the sale of all water entitlements held by eligible irrigators to the Commonwealth Government as part of the buyback scheme. Below Lock 1, irrigation was again restricted due to low water levels. The Lower Murray Reclaimed Irrigation Area continued to suffer from low water levels and most irrigators could not access water until later in 2009–10 as water levels started to improve.

Other issues such as cracking of levee banks and irrigation bays also forced irrigators to change irrigation methods and location of water use. The Lower Murray Reclaimed Irrigation Area has experienced a gradual drying out of irrigation bays due to low allocations and water levels, which has caused major cracking in some areas. Irrigation in these areas has been avoided and water has been traded out and/or irrigation moved to the adjacent highland areas. There has been a major shift from traditional flood irrigation to a focus on growing pasture in the highland areas and feedlot operations.

Due to limited water availability, restrictions on River Murray water use were again applied to Metropolitan Adelaide, Country Towns, irrigation and other allocations. This was the seventh consecutive year of entitlement restrictions from the beginning of a water year.

An initial allocation of 2% for River Murray entitlement holders was announced on 1 July 2009 as a result of low water resource availability. As South Australia's allocation from the shared resources improved, the allocation was increased to 62% of entitlement on 1 March 2010. The late allocation resulted in significant volumes of water being carried over into 2010–11.

South Australia implemented the River Murray Drought Water Allocation Decision Framework for the 2009–10 water year. A number of amendments were made to the framework in October 2009 and March 2010 to enable a change in general water allocations, and also the environment, in response to the repayment of advances and improved water resource availability.

A total of 390 GL was carried over into 2009–10, including 240 GL for critical human water needs (including 39 GL for 2010–11), 50 GL for the Lower Lakes environmental reserve and 100 GL for general allocations. This was the third time that carryover of unused allocation had been permitted in South Australia. The carryover of unused allocation is permitted under the Murray–Darling Basin Agreement and is likely to be included in formal arrangements for a South Australian Storage Right (Schedule G).

Total South Australian diversions from the River Murray for 2009–10 were 480.4 GL, which is the second lowest diversion since the introduction of the Cap. This compromised:

- 56.9 GL for Metropolitan Adelaide and Associated Country Areas
- 37.6 GL for Country Towns
- 14.3 GL for the Lower Murray Swamps (including the environmental land management allocation, which is restricted to the same percentage as irrigation allocations)
- 350.6 GL for metered consumption under the All Other Purposes Cap component, and
- 21 GL for non-metered consumption under the All Other Purposes Cap component.

Table 1: 2009–10 River Murray water use

System	Original long-term average diversion Cap	Climate-adjusted annual Cap target	Cap target adjusted for low allocations	Adjustment to target for net permanent trade	Adjustment to target for net temporary trade (excluding environmental transfers)[3]	Adjustment to target for environ-mental water use	Adjusted Cap target for 2009–10	Diversion for 2009–10	Diversion for last five years	Cap credits		Schedule E trigger
										2009–10	Cumulative since 1997–98	
Metropolitan Adelaide												
First use licence	–	–	–	–	–	–	–	–	16.0	–	–	–
Remainder	650	–	650	–	–	–	–	56.9	556.8	–	–	–
TOTAL	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**56.9**	**572.8**	**–**	**–**	**–**
Country Towns	50	50	31	0	6.6	0	37.6	37.6		0.0	67.1	–10.0
Lower Murray Swamps	94.2	94.2	58.4	–29.2	–1.0	0	28.1	14.3*		13.8	5.6	–18.8
All Other Purposes	449.9	485.9	308.8	61.6	150.3	–4.7	516.2	371.6		144.6	760.3	–90.0
TOTAL	**–**	**–**	**–**	**32.4**	**155.9**	**–4.7**	**–**	**480.4**		**–**		
Combined AOP + LMS	544.1	580.1	367.3	32.4	149.3	–4.7	544.3	385.9		158.4	765.9	–108.8

*The metered consumption was 7.3 GL and an estimated use of 7 GL. Estimations were used due to safety and access concerns at a number of locations along the Lower Murray Swamps.

Significant trading of interstate temporary allocations into South Australia occurred during 2009–10. This trade resulted from the ongoing drought conditions, a slow start to seasonal allocations and entitlement holders purchasing water for carryover into 2010–11. This resulted in a net 252.6 GL of water being temporarily traded to South Australia's bulk water account from interstate. South Australia only traded 22 GL outside the state. Some of the temporary trade from South Australia to Victoria was required as a back trade to give effect to a number of decisions by the Basin Officials Committee to ensure there were no impacts on Victoria as a result of their decisions. As these trades do not constitute a transfer of Cap, they have been subtracted from the temporary trade figure.The temporary trade figure includes 29.77 GL of Commonwealth Environmental Water that was transferred from the Lower Darling, and 47.8 GL of The Living Murray water that was transferred from the upper states. These parcels of environmental water were excluded from trade figures used to assess Cap compliance because they had already been counted in the states where the water was recovered. **Table 2** provides details on the temporary trade, including the sources for the 2009–10 water year. Temporary trades that do not constitute a transferring Cap are listed in **Table 3.**

In addition the cumulative permanent trade adjustment for 2009–10 was 32.4 GL to South Australia and 3.9 GL from South Australia.

Table 2: River Murray interstate water trade 2009–10

Interstate trade	Temporary trade (GL)
From South Australia to Victoria	17.8 GL
From South Australia to New South Wales	4.2 GL
Total out of South Australia	**22 GL**
Into South Australia from Victoria	64.4 GL
Into South Australia from New South Wales	210.2 GL
Total into South Australia	**274.6 GL**

Table 3: Environmental transfers and special deal transfers that are included in the temporary trade but do not constitute a transfer of Cap to South Australia

Environmental transfers	(GL)
Transfer of The Living Murray water from Lower Darling	47.80
Transfer of Commonwealth Environmental Water Holder water from upper states	29.77
Transfer of water associated with special deals	20.00
Total	**97.57**

Metropolitan Adelaide and Associated Country Areas water use

The Metropolitan Adelaide water supply system uses two major water resources:

- natural catchment intakes from the Mount Lofty Ranges, and
- the River Murray.

Normally the Mount Lofty Ranges are the primary source of water because of the significant costs of pumping water from the River Murray over the Mount Lofty Ranges. The Mount Lofty Ranges' storage level is the major factor influencing the amount of water to be pumped from the River Murray. Inflows into the Mount Lofty Ranges' reservoirs improved during spring and as a result only 56.9 GL was pumped from the River Murray.

In an average year approximately 45% of the water is sourced from the River Murray, but this can be up to 90% in extremely dry years.

The five-year rolling total (excluding the first use licence component) diversion for the Metropolitan Adelaide is 556.8 GL, which is 93.2 GL less than the 650 GL limit (refer **Table 4**). The 2006–07 diversion was high due to the additional 60 GL pumped during that year for use during 2007–08 and the 2008–09 pumping was correspondingly less.

Country Towns water use

Country Towns used 37.6 GL in 2009–10 and a base allocation of 31 GL was provided to SA Water. To cover the shortfall between the First Ministers endorsed allocation of 31 GL and the total water used, SA Water leased 6.6 GL of unused allocation on the temporary water market.

Outdoor watering restrictions continued to apply to Country Towns water customers. Many of the Country Towns do not have an alternative water supply and are therefore totally reliant on River Murray water.

The Country Towns Cap is currently restricted on an annual basis from a base allocation of 50 GL. This restricted volume is gazetted at the start of each water year and as noted above, an additional trade of 6.6 GL was required to allow for use in 2009–10. **Table 5** outlines the revised Country Towns Cap credits for the implementation of the gazetted restriction.

Table 4: Metropolitan Adelaide Cap assessment

	2005–06	2006–07	2007–08	2008–09	2009–10	Total
Gross diversion	73.9	203.1	89.4	149.5	56.9	**572.8**
First use licence	16.0	0.0	0.0	0.0	0.0	**16.0**
Rolling diversion against 650 GL Cap	**57.9**	**203.1**	**89.4**	**149.5**	**56.9**	**556.8**
Five year Cap						**650.0**
Amount below limit						**93.2**

Table 5: Country Towns Cap credits

	97–98	98–99	99–00	00–01	01–02	02–03	03–04	04–05	05–06	06–07	07–08	08–09	09–10
Annual allocation	100%	100%	100%	100%	100%	100%	100%	95%	100%	60%	62%	62%	62%
Credit	15	14	13	12	3	0	5	4	2	0	0	0	0
Cumulative Credit	15	28	42	54	56	56	61	65	67	67	67	67	67

Lower Murray Swamps water use

The Lower Murray Reclaimed Irrigation Areas, located between Mannum and Wellington, were formerly wetlands that were permanently connected to the River Murray. The Cap on the Lower Murray Swamps was agreed in 2001 by Ministerial Council and was based on recognised best irrigation practice applied to approximately 5,000 hectares of former wetlands irrigated for dairying as well as an additional 780 hectares of the adjoining highland.

Until recently, the irrigated areas were not metered, with a specific number of waterings permitted each year. If water was transferred out, the appropriate portion of irrigated land was retired. The Cap was defined as net water use and no Cap credit has been claimed since the commencement of the Cap.

Metering is now complete although some diversions were provided as estimated use due to riverbank slumping preventing access to some meters.

Water allocations within the Lower Murray Reclaimed Irrigation Areas have been treated in the same manner as all other irrigation licences, and were set at 62% for 2009–10. A total of 14.3 GL was diverted for irrigation and environmental land management allocation use in 2009–10 and this includes an estimated 7 GL of non-metered use. The 7 GL was calculated by applying the percentage of metered use against the restriction and trade adjusted annual Cap target, which represented 28%.

An estimate of the non-metered use was required due to access issues along the Lower Murray Swamps, in particular slumping and cracking making areas unsafe.

All Other Purposes water use

The All Other Purposes Cap component encompasses all diversions from the River Murray within South Australia with the exception of:

- diversions for Metropolitan Adelaide and Associated Country Areas from the Mannum–Adelaide, Murray Bridge–Onkaparinga, Swan Reach–Stockwell and Morgan–Whyalla pipelines
- diversions for Country Towns (including the Morgan–Whyalla and Tailem Bend –Keith pipelines), and
- diversions for Lower Murray Reclaimed Irrigation Area.

Included in the All Other Purposes are stock, domestic, environmental, industrial and recreation entitlements. Annual water restrictions apply to all purposes with the exception of industrial, stock and domestic that equates to approximately 20 GL.

Total usage under the All Other Purposes component of the Cap during 2009–10 was 371.6 GL, including 21 GL for non-metered stock and domestic use, or 83% of the long-term average diversion Cap for the All Other Purposes of 450 GL.

This reflects the impact of the restrictions applied to this Cap component. Due to significantly reduced water availability, a maximum allocation of 62% was made available for South Australian River Murray irrigators in March 2010. After this date no further allocations were announced, in line with the decision by Basin Officials Committee.

A Cap model for the All Other Purposes diversions has been developed to enable a comparison of diversions with an annual climate-adjusted Cap target. The Cap model for the All Other Purposes is a regression model in which the historical monthly demands are adjusted (de-trended) to reflect 1993–94 levels of development. An annual Cap target is then derived through regression of the de-trended data with rainfall and temperature data from Berri and Loxton and scaled up by 449.9/440.6 GL to account for the transfer of 9.3 GL from the Lower Murray Swamps Cap.

The climate-adjusted Cap target for 2009–10 based on this model was 485.9 GL. This figure is then adjusted to take into account the final 62% allocation. The climate and restriction adjusted Cap for 2009–10 is 309 GL. In addition, there was an adjustment of 150.3 GL to allow for temporary and permanent trade adjustments, excluding the transfer of environmental water. There was also an environmental adjustment of -4.7 GL for water required within South Australia for The Living Murray. This adjustment is based on the usage of this water this year. The volume of The Living Murray water recovered within South Australia, which has been carried over until next year, will reduce the Cap when it is used.

The Cap credit generated for 2009–10 is 144.6 GL and the cumulative Cap credit since 1997–98 is now 760.3 GL.

Merger of the All Other Purposes and Lower Murray Swamps Cap valleys

Currently both Cap valleys are accounted for separately under Schedule E Cap on Diversions and the current long-term diversion caps, as outlined under clause 7, are:

- 94.2 GL for the Lower Murray Swamps (including 22.2 GL for the environmental land management allocation, which is non-tradeable, and
- 449.9 GL for the All Other Purposes. The All Other Purposes Cap was amended to include the 9.3 GL highland irrigation allocations of the Lower Murray Swamps in March 2008 and the Cap subsequently was increased from 440.6 GL to 449.9 GL.

Transfer of the 9.3 GL highland irrigation allocations was agreed in March 2008 when the Murray–Darling Basin Ministerial Council adopted the new Schedule E (formerly Schedule F). These diversions were metered and it was therefore administratively convenient to account for this water as part of the All Other Purposes Cap valley.

There has been a significant amount of permanent entitlement trade from the Lower Murray Swamps to the All Other Purposes Cap since 2004 and an annual adjustment would occur to adjust the Cap for this permanent trade. The annual transfer process will no longer be necessary under the amalgamated Cap.

After removing the permanent trade, the total volume of remaining allocation (including environmental land management allocation of 22.2 GL) is 47.0 GL. This 22.2 GL allocation will remain a non-tradeable entitlement attached to the Lower Murray Swamps under this arrangement.

A new combined All Other Purposes long-term annual diversion Cap would be 544.1 GL. The combined Cap will need to be adjusted for permanent trades, temporary allocation trade, use of environmental allocation and to include restrictions in years where the final announced allocation is less than 100%.

A summary table of the combined All Other Purposes and Lower Murray Swamp Cap valley adjusted for trade and water restrictions is provided in **Table 6.** The table shows that diversions have remained under Cap and a cumulative Cap credit of 766 GL has been accrued since 1997–98.

Environmental water use

In addition to the 766 GL delivered to the Lower Lakes, other watering activities were undertaken at a number of locations above and below Lock 1.

The calculation of the annual Cap target for the All Other Purposes Cap valley has been adjusted to represent the volume of 4.7 GL of South Australia The Living Murray water used for environmental purposes in 2009–10.

4.1.3 Administration of the Cap

South Australia continues to be well-placed to manage diversions within the respective Caps. The majority of water diverted from the River Murray is metered and only a small amount of the diversion is estimated usage. All diversions remained within their annual Cap targets and all valleys remain in cumulative Cap credit.

South Australia has undertaken a merger of the remaining Lower Murray Swamp Cap into the All Other Purposes Cap. The March 2009 report of the IAG supports this as a logical step forward that will make trade and measurement of this component more administratively convenient. The non-tradable environmental land management allocation will also be merged into the All Other Purposes component; however, it will remain completely non-tradeable and designated for environmental use only in the lowland region.

Although this merger is administratively simple, it will require an amendment to Schedule E of the Murray–Darling Basin Agreement and will therefore require the approval of Ministerial Council during 2010–11.

Restrictions on allocations

The All Other Purposes and Lower Murray Swamp Cap valleys are currently administered under debit and credit arrangements. This means that when water use is below the annual Cap target, a credit is allocated to that valley or vice versa if use is above the annual Cap target.

In its 2007–08 report, the IAG recommended that a restriction allowance be included in the calculation of annual Cap targets for both Cap valleys. This analysis shows that diversions have remained under Cap and a cumulative Cap credit of 766 GL has been accrued since 1997–98 (**Table 6**).

In the years 1997–98 to 2006–07 diversions for the Lower Murray Swamps were assumed to be equivalent to the entitlement, which was reduced for both temporary and permanent trade. No Cap credits were generated from the Lower Murray Swamps during that period.

The Country Towns Cap valley has also been adjusted to include years where restrictions were implemented.

Table 6: Combined All Other Purposes (AOP) and Lower Murray Swamps (LMS) use and Cap calculations

Combined AOP and LMS Cap	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AOP Cap targets from model (440.6 GL/yr)	417.5	429.1	430.4	444.0	437.6	468.5	466.4	418.1	416.1	477.6	456.9	470.0	475.9
Scaled up Cap targets from model (449.9 GL/yr)	426.3	438.2	439.5	453.4	446.8	478.4	476.2	426.9	424.9	487.7	466.5	479.9	485.9
LMS annual Cap target	94.2	94.2	94.2	94.2	94.2	94.2	94.2	94.2	94.2	94.2	94.2	94.2	94.2
Combined annual Cap target (449.9+94.2)	520.5	532.4	533.7	547.6	541.0	572.6	570.4	521.1	519.1	581.9	560.7	574.1	580.1
Announced allocation	100%	100%	100%	100%	100%	100%	95%	95%	100%	60%	32%	18%	62%
20 GL unrestricted use	20	20	20	20	20	20	20	20	20	20	20	20	20
Combined Cap targets based on final allocation	520.5	532.4	533.7	547.6	541.0	572.6	542.9	496.1	519.1	357.1	193.0	119.7	367.3
Total permanent trade (LMS + Other)	0.0	3.1	8.0	12.0	13.0	13.7	13.3	18.1	19.7	32.4	32.4	32.4	32.4
Temporary allocation trade (excludes environmental transfers)	-16.8	0.5	-1.7	3.3	-7.3	-9.0	6.0	-5.4	-32.3	29.4	138.3	330.2	149.3
Total trade adjustment	-16.8	3.6	6.3	15.2	5.8	4.7	19.3	12.6	-12.6	61.9	170.7	362.6	181.7
Environmental adjustment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.1	-50.0	-4.7
Final AOP and LMS Cap target	503.7	535.9	540.0	562.8	546.8	577.3	562.2	508.7	506.5	419.0	362.6	432.3	544.3
Recorded diversion for LMS + Other	475.8	500.0	466.9	520.1	502.7	532.4	489.9	510.2	475.7	382.2	296.2	298.4	385.9
Annual Cap credit/debit	28.0	35.9	73.1	42.7	44.1	44.9	72.3	-1.5	30.8	36.7	66.4	134.0	158.4
Cumulative Cap credit	28.0	63.9	137.0	179.7	223.9	268.7	341.0	339.5	370.3	407.1	473.5	607.5	765.9

Metropolitan Adelaide Cap model development

The IAG has recommended South Australia develop a new climate-adjusted annual Cap model of diversions from the River Murray for Metropolitan Adelaide, taking into account urban demand, local catchment inflows, system operations and allowances for water restrictions.

Work has progressed on the new climate-adjusted Cap model for Metropolitan Adelaide and associated Country Areas. The development to date has used an approach consistent with other Cap models across the Murray–Darling Basin. The complexity and variability of the Metropolitan Adelaide water supply system has resulted in a number of technical issues that need resolving to ensure that the most robust and appropriate models for determining diversion from the River Murray and inflows to the Mount Lofty Ranges' storages are used for 2000 level of development conditions. These issues, together with the associated modelling, are expected to be finalised over the next six months.

A detailed modelling report will then be provided for review by the MDBA.

4.1.4 Monitoring and reporting

Urban consumption (Metropolitan Adelaide and Country Towns) and irrigated consumption under the All Other Purposes Cap component is reliably metered. South Australia continues to make improvements to ensure that the standard of metering of direct diversions is satisfactory.

Metering of the Lower Murray Swamp irrigation areas is now complete although there continues to be some loss of meters due to riverbank slumping.

South Australia, through SA Water, transports water from the Murray to other basins for irrigation. These diversions and trades are accounted for, as specified in Schedule E, and South Australia debits this water against the originating allocation.

4.1.5 IAG assessment

Consumption in South Australia continues to be significantly constrained.

Diversions for Country Towns, Metropolitan Adelaide and All Other Purposes were below Cap.

While diversions for the Lower Murray Swamps are now fully metered, some estimates had to be made for usage due to loss of meters as a result of riverbank slumping. Estimates were also used due to safety and access concerns at a number of locations along the Lower Murray Swamps. The metered consumption was 7.3 GL and estimated use was 7 GL. South Australia has applied the percentage of metered use against the restriction and trade-adjusted annual Cap target, which represented 28%.

Metropolitan Adelaide consumption over the last five years was 556.8 GL (excluding the first use licence) compared with the five-year rolling target of 650 GL. Compliance with this Cap has been enhanced by transfer over the last five years of 16.0 GL from All Other Purposes designated valleys and Country Towns under the first use licence.

In its 2007–08 Cap report, the IAG recommended that South Australia develop a climate-adjusted model for the Metropolitan Adelaide Cap. Work continues on this model and, following the resolution of technical issues, will be submitted for accreditation and, subject to approval, subsequent use in the 2010–11 audit. The technical issues relate to the calculation and measurement of annual inflows into the Mount Lofty Ranges' storages, average annual extraction limits, environmental water provisions and calculation of the annual climate-adjusted Cap target to represent the 2000 levels of demand.

South Australia has also taken into account the impact of water restrictions when determining Cap credits. This IAG recommendation has been adopted. For 2009–10 in the All Other Purposes model, which is a climate-adjusted model, adjustments for years in which water restrictions have applied have been made.

In its 2008–09 report, the IAG recommended that South Australia reflect the long-term Cap equivalent (LTCE) values of water held for The Living Murray purposes. South Australia has adjusted the All Other Purposes annual Cap target for use by The Living Murray water recovered in South Australia for the 2009–10 year.

South Australia has progressed the amalgamation of the remaining Lower Murray Swamps Cap components with the All Other Purposes Cap, and has provided indicative reporting in their submission for the 2009–10 year. Under an amalgamated regime, the annual transfer of permanent entitlement trade from the Lower Murray Swamps to the All Other Purposes Cap will no longer be required. In addition, the non-tradeable environmental land management allocation will be merged into the All Other Purposes component; however it will remain non-tradeable and designated for lower valley environmental use only.

The IAG notes that the amalgamation is administratively more convenient, and has no impact on the Cap volume within South Australia. The combined cumulative Cap credit has been calculated as 766 GL. This is equal to the cumulative Cap credits of 760 GL and 6 GL currently calculated for the All Other Purposes Cap and the Lower Murray Swamps respectively. It is expected that a submission for the required amendment to Schedule E will be made to the Ministerial Council during the 2010–11 year to enable the amalgamated position to be reported for the 2010–11 year forward.

South Australia continues to be well-placed to quantify the Cap and reliably report against it. Reliable consumption measurement is in place for both urban and non-urban (irrigation) uses. Metering arrangements are now in place for the Lower Murray Swamps, and while their use has been affected by access and safety concerns, an appropriate methodology for estimation has been applied where necessary.

The IAG acknowledges the full and clear presentation of data on water use under the Cap provided by South Australia.

4.1.6 Conclusions and recommendations

- Diversions in 2009–10 were 480 GL compared to diversions of 485 GL in 2008–09.
- Diversions in 2009–10 continue to be constrained as a result of restrictions due to ongoing drought and are well within the annual Cap targets for Metropolitan Adelaide, Country Towns, Lower Murray Swamps and All Other Purposes Cap valleys.
- South Australia has a reliable measurement system for urban water and irrigation uses.
- An allowance has been included in the calculation of the annual diversion targets for the imposition of water restrictions. This is the second year that such an allowance has been made, and is now embedded in the process.
- The South Australian All Other Purposes Cap model was approved by the MDBA in November 2004 and the climate-adjusted Cap for 2009–10 was adjusted down to account for water restrictions in the latest year.
- An adjustment for the use of The Living Murray water recovered in South Australia has been allowed in the 2009–10 Cap reporting by South Australia, and the transfer of environmental water from interstate has been excluded from the temporary trade adjustment.
- The IAG notes that the methodology used for estimating diversions in the Lower Murray Swamps has been necessary due to the difficulty in accessing meters and associated safety concerns. The IAG believes that South Australia has adopted an appropriate methodology for such circumstances.
- The IAG has previously recommended that South Australia develop a climate-adjusted model of diversions from the River Murray for Metropolitan Adelaide. The finalisation of the model was delayed until technical issues were resolved. The IAG understands that the model should now be submitted for accreditation and, subject to approval, used for the 2010–11 year.
- South Australia has provided an analysis of the proposed amalgamation of the remaining Lower Murray Swamps Cap components with the All Other Purposes Cap while retaining the environmental land management allocation as a non-tradeable component within the All Other Purposes Cap. The IAG supports the amalgamation, subject to clear reporting each year to ensure the environmental land management allocation continues to be applied to the Lower Murray Swamps. The IAG notes that an amendment to Schedule E is required and a submission will be made to Ministerial Council during 2010–11.

4.2 Victoria

4.2.1 The Cap assessment tools

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 (see **Table 7)**.

The model for Goulburn/Broken/Loddon and Campaspe valleys was accredited by the then Murray–Darling Basin Commission at Meeting 93 on 4 September 2007. The Campaspe valley component of the model has been amended in 2009 to revise the river transmission loss so that it operates satisfactorily for a wider range of hydrological conditions including the recent severe drought. The approved updated model has been used to calculate 2009–10 Cap targets and the cumulative credits.

As a result of revised model input data for May and June 2009, and for whole of 2008–09 in case of Waranga Basin unaccounted loss, the 2008–09 Cap target for Goulburn/Broken/Loddon Valley was less than the figure reported last year by 76 GL (approximately 3.7% of the long-term Cap).

Revision of model input data for May and June 2009 reduced the 2008–09 Cap target for Campaspe Valley slightly, compared to figures reported last year (less than 1% of the long-term Cap).

The former Murray–Darling Basin Commission 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. These models, excluding the Lower Darling component, were accredited by the former Murray–Darling Basin Commission at Meeting 96 on 26 August 2008.

The model that had been accredited was updated in 2008–09 to include:

(a) modifications to the Lower Darling diversion and Tandou modelling, Lower Darling restriction policy, revised estimates of Hume inflows and 1993–94 level of development Snowy releases, and

(b) minor modifications such as revised dead storages, outlet capacities, handling of lakes Tandure, Copi Hollow and Speculation and a correction to the methodology used to set diversions to historical values before 1997.

The updated model was used to calculate the Cap targets in 2009. This model was further updated during 2009–10 to correct small errors in the restrictions of Victorian water use in dry years.

The Cap model for the Wimmera–Mallee Valley, developed by Grampians Wimmera–Mallee Water, has been submitted to the MDBA for accreditation. The water audit panel agreed at Meeting 4 on 10 December 2009 that the model be sent to a model auditor. This model has been used to calculate the 2009–10 Cap targets, the cumulative credits since 1997–98 and the long-term Cap for this valley.

A paper describing how Victoria proposes to adjust the Cap for environmental flows was approved by MDBA in October 2010, as required under Schedule E of the Murray–Darling Basin Agreement. This interim method was applied to account for water recovered for the environment through initiatives such as Snowy environmental flows and The Living Murray, including decommissioning of Lake Mokoan.

As a result of revised model input data for May and June 2009, the 2008–09 Cap target for the Wimmera–Mallee Valley changed slightly, compared to figures reported last year (less than 0.5% of the long-term Cap).

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

4.2.2 Comparison of annual diversions with the annual Cap targets

Overview

At the start of July 2009, a zero allocation was announced by Goulburn–Murray Water (GMW) for the Murray, Goulburn, Broken, Loddon, Campaspe and Bullarook systems. This is the third consecutive year when the opening allocation was zero.

The final allocations for the Murray and Goulburn systems were 100% and 71% respectively of high reliability water share The Broken, Loddon and Bullarook systems had final allocations of 13%, 3% and 19% of high reliability water share respectively. The Campaspe system was the only system which had a zero allocation for the whole season.

The Minister for Water qualified rights to water for all systems early in the year to enable essential supplies to continue until conditions improved. The use of water for qualified purposes expired on the Goulburn and Murray systems once allocations reached 20% of high reliability water share.

During 2009–10, the July and August rainfalls were below average in all areas. In September 2009, catchments upstream of storages received average to above average rainfall while the October 2009 rainfall was less than normal. November rainfall was well above average, while December rains were below. Rainfall during the rest of the year was generally

Table 7: Victoria Cap auditing: status of models

Valley	Auditing tool	Comment
Goulburn/Broken/Loddon	GSM REALM model	Accredited
Campaspe	GSM REALM model	Accredited – modifications approved
Murray	Murray simulation model	Accredited – updates expected to be approved
Kiewa/Ovens	Regression model	Accredited
Wimmera–Mallee	REALM model	Submitted for accreditation

Table 8: Comparison of diversions with Cap targets 2009–10

System	Long-term diversion Cap (GL)	This year's Cap model target (GL)	Out of model Cap component (GL)	Cap adjustment for trade [1] (GL)	Cap adjustment for environmental use (GL)	This year's net [4] diversion (GL)	This year (GL)	Cap Credits (Target less diversion)			20% schedule trigger (GL)	Trigger exceeded	Storage difference Simulated less observed (GL)
								Cumulative credit from last year's WAM report (GL)	Correction to last year's cumulative credit (GL)	Cumulative since July 1997 (GL)			
Goulburn/ Broken[3]/ Loddon	2,034	1,221	17	– 95	– 10	804	327	214	–76[5]	466	– 407	No	– 461
Murray/ Kiewa/ Ovens	1,702	1,264	2	46	–37	971	304	657	116[6]	1,162	– 340	No	– 526
Campaspe	122	21	0	27	0	26	22	125	–1	146	– 24	No	– 40
Wimmera–Mallee [2]	159	55	1	1	0	10	48	111	1	159	– 32	No	– 55
TOTAL	**4,017**					**1,810**							

1. Includes adjustment for Goldfields Superpipe transfers
2. Based on results from the interim Wimmera–Mallee Cap model, does not include adjustment for environmental use
3. Cap adjusted for decommissioning of Lake Mokoan
4. Diversion net of transfers to other Cap valleys
5. Mainly due to correction of input data from Warranga Basin loss
6. Due to change in model

above average with almost all areas reporting significant rainfall during February and March 2010. The months of January, April and May 2010 were mixed with some areas having above average rainfall. It was relatively dry during June 2010 with only a few areas recording above average rainfall.

The major storages on the Goulburn, Loddon, Broken, Campaspe, Bullarook, Murray and Wimmera–Mallee systems all failed to fill to capacity in 2009–10. However, lakes Buffalo and William Hovell on the Ovens system both filled to capacity.

There was no pumping at Waranga Basin as was the case in 2008–09. At Tullaroop reservoir, pumps were used to maintain a small flow in Tullaroop Creek as a gravity supply was not possible. During the year the qualified release from Tullaroop reservoir averaged 3 ML/day, ranging from 1.3 ML/day to a maximum of 6.4 ML/day to improve the health of the creek as required.

Inflows to the Campaspe and Loddon systems in 2009–10 were only 10% and 3% of their long-term averages respectively. Although Eildon, Hume and Dartmouth storages received relatively higher natural inflows, they were 69%, 45% and 67% of their long-term averages respectively. The inflow to Lake Eildon since November 1996, when the storage was last full, has been the lowest on record for this sequence.

During 2009–10, diversions from all four valleys (Goulburn/Broken/Loddon, Campaspe, Murray/Kiewa/Ovens and Wimmera–Mallee) were below their Cap targets. All these Victorian valleys have accumulated Cap credits up to 30 June 2010. A comparison of cumulative diversions with Cap targets since 1997–98 is shown in **Table 8**. These values are preliminary, as trade data needs to be reconciled with other valleys and accuracy is yet to be checked.

Carryover of unused allocation mainly contributes to Cap credits in the year the water was allocated. The total unused allocation carried over from 2009–10 to 2010–11 was 482 GL in Victorian Murray, 356 GL in Goulburn/Broken/Loddon including 11 GL of unused trade for pumping via the Goldfields Superpipe stored in Lake Eildon. The corresponding carryovers for 2009–10 were 170 GL and 110 GL for the Victorian Murray and Goulburn/Broken/Loddon valleys respectively.

Changes to model inputs have changed Cap targets, and therefore Cap credits, back to 1997–98 compared with figures reported in previous years.

Goulburn/Broken/Loddon

Resource availability

Annual rainfall at Eildon was 70% of average for 2009–10, marginally less than for the previous year. Annual inflow to Lake Eildon was 69% of average, almost twice the volume received in 2008–09. The cumulative inflow to Lake Eildon from October 1996 to the end of June 2010 was the lowest on record for this 164 month sequence. After peaking at 33.5% of capacity in early November 2009, Lake Eildon was drawn down to 23.9% of capacity by late April 2010 and then recovered to be 27.6% full at 30 June 2010.

The contribution from the unregulated catchment between Eildon and Goulburn Weir for 2009–10 was 36% of average. During the year there were only two brief periods of unregulated release at Goulburn Weir. The maximum release of 2.9 GL/day occurred in early March 2010 following heavy rain.

The total transfer from the Goulburn Valley account to the River Murray was 67.6 GL, comprising 35.5 GL via the Goulburn River, 28.2 GL via the Broken Creek and 3.8 GL via the Campaspe River. A loss allowance of 809 ML was recorded against the Murray flora and fauna account for Goulburn Valley account water delivered via the Campaspe River.

In addition to the Goulburn Valley account water supplied to the River Murray via the Broken Creek, there was 818 ML delivered respectively from the Goulburn bulk entitlements water quality reserve. There was also 700 ML of Lake Mokoan/Snowy water transferred from last year's account to the River Murray measured at Orrvale on the Broken River.

The initial 2009–10 allocation on the Goulburn system was zero. An allocation of 7% high reliability water share for the Goulburn system was announced on 15 September 2009. Following good rainfall in the last half of September 2009, the allocation increased to 30% on 1 October 2009. There were then a further 12 relatively small increases in allocation during the balance of the year, with a final Goulburn allocation of 71% high reliability water share announced on 1 April 2010. This is the twelfth year in a row where there has not been a low reliability water share allocation in the Goulburn system.

Lake Nillahcootie annual inflow for 2009–10 was 5% of average and the storage reached a maximum of 31.5% in early January 2010. By late May 2010, Lake Nillahcootie had been drawn down to 22.1% of capacity.

Very low carryover volumes combined with inflows well below average resulted in the Cairn Curran and Tullaroop reservoirs both reaching 6.8% and 6.2% of capacity respectively. The maximum volumes were very close to those reached in 2008–09.

Cairn Curran and Tullaroop reservoirs were drawn down to the fourth and second lowest levels on record respectively. The natural flow at Laanecoorie reservoir was only 3% of the yearly long-term average. For the sixth successive year Laanecoorie reservoir has failed to fill to its capacity, and the volume in mid April 2010 was 1.9 GL, or 24.1% of capacity.

While Newlyn reservoir reached 38.3% of capacity, Hepburns Lagoon was effectively empty all year. There was no transfer of water from Newlyn reservoir to Cosgrave reservoir in 2009–10. During 2009–10, 390 ML was transferred from Cosgrave reservoir to White Swan reservoir at Ballarat.

No allocation was announced for the Loddon system until 15 March 2010 when 3% high reliability water share was made available. Qualification of rights was declared by the Minister for Water to meet essential human and environmental needs only. Given the very poor Loddon resource position, a Loddon supplement was not available for the Boort Irrigation Area.

There was 86 ML delivered to the Quambatook township via the Normanville Pipeline. Apart from this supply, there was water delivered to the Wimmera–Mallee system from the Waranga Western Channel for stock and domestic purposes.

A total of 2.4 GL was transferred from the Murray bulk entitlements (flora and fauna), mainly to cover water delivered to wetlands in the Goulburn and Loddon systems. This volume included 809 ML for losses incurred delivering Goulburn Valley account water to the Campaspe River as well as 1.2 GL for Boort wetlands.

The Boort wetlands were also supplied with 761 ML of environmental water from the Loddon bulk entitlement. There was a further 100 ML delivered to Little Lake Boort from donated water.

Cap compliance

Diversion from the Goulburn/Broken/Loddon valley was 804 GL, which is 327 GL less than the Cap target of 1,131 GL (with preliminary adjustment for trade, environmental releases, decommissioning of Lake Mokoan and inter-valley transfers). Diversions were 61% below the long-term Cap of 2,034 GL/year. The cumulative Cap credit to June 2010 is 466 GL.

Murray/Kiewa/Ovens

Resource availability

Inflows to Dartmouth and Hume reservoirs were 45% and 67% of the annual average respectively. Lake Dartmouth reached 50.4% of capacity in early April 2010 and at the end of June 2010 the reservoir was 32.8% full. Lake Hume was 40.4% in early November 2009 and by late April 2010 the storage had been drawn down to 15.5% of capacity. By 30 June 2010, Lake Hume had recovered to 26.8% of capacity.

The release from Lake Dartmouth to satisfy in-valley commitments and transfer to Lake Hume was 147.3 GL.

The Menindee Lakes were as low as 7.1% of capacity in early January 2010. Over the next six months high inflows from the Darling River resulted in the combined storage volume in the Menindee Lakes being 88% of capacity by the 30 June 2010. The volume held in the Menindee Lakes rose above 640 GL on 10 April 2010. At this volume, control of the Menindee Lakes transfers to the MDBA under the operating agreement.

Lake Victoria was 35.7% full at the start of July 2009 and rose to a maximum of 81% in early April 2010 following higher inflows resulting from flood in the Darling River. By 30 June 2010 the storage had been drawn down to 52.8% full.

The opening allocation on the Murray system was 0% high reliability water share. An allocation of 2% high reliability water share was announced on 1 September 2009. There were then two weekly incremental allocation increases until the final allocation of 100% high reliability water share was announced on 1 April 2010.

During the year, the total volume supplied from the River Murray to the Northern Mallee Pipeline was 3.5 GL.

In total, 13.1 GL of water from the Murray bulk entitlement (flora and fauna) account was supplied to Kinnaird's Swamp, Richardson's Lagoon, Gunbower Forest, McDonald's Swamp, Round Lake, Hattah Lakes, Cardross Lakes and Lower Murray River Red Gum forests. There was 10.6 GL of The Living Murray and 11.2 GL of Commonwealth water supplied to the Lower Murray River Red Gum forests at Hattah Lakes and Lake Wallawalla. The Australian Conservation Foundation donated 400 ML to Hattah Lakes and Chalka Creek for environmental purposes.

During 2009–10, Goulburn–Murray Water took the opportunity to harvest unregulated River Murray flows into Lake Boga and Lake Charm. These two lakes now form part of the Victorian mid Murray storages in a post Lake Mokoan era. The total volume harvested into these two lakes was 23.7 GL, including 16.3 GL delivered to Lake Boga during the period from March to May 2010.

Cap compliance

Diversion from the Murray/Kiewa/Ovens valley was 971 GL, which is 304 GL less than the Cap target of 1,275 GL (with preliminary adjustment for trade and environmental releases). The diversion was 43% below the long-term Cap of 1,702 GL/year. The cumulative Cap credit since July 1997 is 1,162 GL.

Campaspe

Resource availability

Inflow to Lake Eppalock excluding the Coliban system was only 10% of average. The storage held 6% of capacity at the start of the year. The minimum volume in storage was equivalent to 5.5% of capacity in late August 2009 and the storage recovered to 8.7% on 30 June 2010.

The total volume of water pumped via Goldfields Superpipe from the Waranga Western Channel at Colbinabbin was 26.4 GL, which is 899 ML more than in 2008–09. Out of this volume, 13.9 GL was transferred to Lake Eppalock, 120 ML supplied to Heathcote, 7.5 GL to Bendigo and 4.9 GL to Ballarat. Therefore the catchment inflows to Lake Eppalock were augmented by 13.9 GL supplied from the Goulburn system. There was no Goulburn bulk entitlement water quality entitlement delivered to Coliban Water or Central Highlands Water during 2009–10.

There was no supply to Heathcote from Lake Eppalock. During the year, 8.2 GL was pumped from Lake Eppalock, of which 2.8 GL was delivered to Bendigo and 5.5 GL to Ballarat. The total volume transferred to Ballarat in 2009–10 was 10.4 GL compared to 11.4 GL in 2008–09. The total volume supplied to Bendigo was 10.3 GL.

As has been the practice for some years now, Campaspe Weir operated below full-supply level to minimise evaporation and loss of water due to spills. There were no unregulated flows passing Campaspe Weir for the entire year.

At the start of the year, due to the extremely poor resource position, the Minister for Water qualified rights to provide a limited supply for essential needs. The irrigation allocation remained zero for the entire year.

The Campaspe bulk entitlement minimum flow requirement downstream of the Campaspe Siphon, which is tied to natural flows, was effectively zero for most of the year.

On 13 November 2009, Goulburn–Murray Water commenced transferring Goulburn Valley account water sanctioned by the MDBA to the River Murray via the Waranga Western Channel (WWC) and the lower Campaspe River to maintain environmental values in the lower Campaspe River. The Goulburn Valley account transfer continued uninterrupted until 14 May 2010 and ranged from 10 ML/day to 100 ML/day as directed by the North Central Catchment Management Authority.

The total Goulburn Valley account water transferred to the River Murray via the lower Campaspe River was 3.8 GL. The provision of this transfer required an allowance of 809 ML to be debited against the flora and fauna account which required a transfer from the River Murray.

Cap compliance

Diversion from the Campaspe Valley was 26 GL, which is 22 GL below the Cap target of 48 GL (with adjustment for trade to supply the Goldfields Superpipe). Diversions were 79% below the long-term Cap of 122 GL/year. The cumulative Cap credit since July 1997 for the Campaspe Valley is 146 GL.

Wimmera–Mallee

Resource availability

The latter part of the 2008–09 experienced some reasonable inflows resulting in an easing of water restrictions for consumptive users. These inflows allowed the 2009–10 season to commence with good starting allocations. However, inflows were still below the long-term average making it the thirteenth consecutive year of below average inflows to the Wimmera–Mallee system. The Grampians' storages remained low, including four that remained empty. The maximum storage volume for the system was 116.9 GL (15.7 %) in October 2009 and the minimum was 76.7 GL (10.3 %) in June 2010. For the purposes of Murray–Darling Basin reporting, diversions for the year July 2009 to June 2010 totalled 8.7 GL. From 2010–11 the water year will be the standard 1 July to 30 June, as for other valleys.

2008–09 Wimmera–Glenelg bulk entitlement water year (November 2008–October 2009)

Allocations opened at 25.7 GL with the final allocation for the 2008–09 water year being 76.8 GL. An additional reserve volume of 33.9 GL was also created for the year; the first time in the history of the Wimmera–Glenelg bulk entitlement that the resource situation allowed this.

An amendment to the Wimmera–Glenelg bulk entitlement was made in January 2009, and again in November 2009, to reallocate water savings from the Wimmera–Mallee Pipeline project. This meant a change in water products available under the bulk entitlement and also a larger entitlement for the environment, including the provision of passing flows at key locations on the Wimmera and Glenelg rivers.

No channel run was made during the 2008–09 year. All customers supplied from Systems 1, 2 and 5 transitioned from emergency to reliable supplies as practical completion of these sections were announced. Townships in Supply Systems 3, 4 and 6 began to receive supplies from the pipeline this year. Due to the progress of the Wimmera–Mallee Pipeline project, rural customer water supplies were progressively connected to the pipeline, or received water through Goulburn–Wimmera–Murray Water's water carting program until their respective service connections were installed. Good rainfall during the late 2008–09 Wimmera–Glenelg water year also helped customers, particularly in the Supply System 6 area, to meet their water supply needs from local catchment runoff.

The final allocation of 76.8 GL meant that the high reliability Wimmera–Mallee Pipeline project products reached 100% allocation. This includes all urban, rural and recreation water products.

The final supply by agreement (commercial customers) allocations for 2008–09 was 100% for customers supplied from the Wimmera–Mallee Pipeline project and 70 % for direct from headworks customers.

The January 2009 amendment provided the environment with passing flow rules (as an unregulated entitlement) as an adjunct to its regulated entitlement. A total of 11.1 GL was supplied as passing flows to the Wimmera and Glenelg River. The environment's final allocation was 19.5 % with a total of 7.0 GL delivered from the regulated entitlement. These volumes, totalling 18.1 GL, were delivered to the Wimmera, Glenelg and MacKenzie rivers and Burnt Creek.

Progress under the 2009–10 Wimmera–Glenelg bulk entitlement water year (November 2009–October 2010)

The opening allocation for the 2009–10 bulk entitlement year was 75.3 GL. This allocation will remain constant while a reserve is built to provide water for basic requirements the following year. The accumulated reserve volume as of 7 July 2010 was 2.9 GL.

Wimmera–Mallee Pipeline project products were at 100% allocation (including water for recreation, supply by agreement, urban and rural customers). The supply by agreement (headworks customers) allocation was at 68%, environment 19.5% and irrigation 0%. Large volumes of domestic and stock channel entitlement were available (due to the partial amendment of Wimmera–Mallee Pipeline project water savings) but remained unused. Both Coliban and Wannon Water also had 100% allocation for their entitlements.

No channel run was made during the 2009–10 year with domestic and stock channel supplies no longer required within any part of Goulburn–Wimmera–Murray Water's operational area. Practical completion for the Wimmera–Mallee Pipeline project was announced on 28 May 2010 with all customers supplied from Systems 1, 2 and 5 continuing to receive reliable supplies and townships in Supply Systems 3, 4 and 6 also receiving supplies. Rural customers for Supply Systems 3, 4 and 6 received emergency supplies only. Eligible rural customers were able to receive water through the Goulburn–Wimmera–Murray Water water carting program until their respective service connections were installed. By June 2010, all customers were receiving reliable supplies.

The final amendment to the Wimmera–Glenelg bulk entitlement is expected to occur in September 2010 to reallocate the final savings from the Wimmera–Mallee Pipeline project. Under this amendment, further water will be returned to the environment by way of passing flow rules, high reliability entitlements established for the Wimmera–Mallee Pipeline project, and a growth water volume established for later sale.

Cap compliance

Based on results from the interim Cap model submitted to MDBA for accreditation, the 2009–10 Cap target is 57 GL (with preliminary adjustment for trade) and the long-term average Cap is 159 GL/year. Diversion from the Wimmera–Mallee Valley in 2009–10 was 10 GL, which is 48 GL less than the Cap target. Usage has remained within Cap,

as there have been significant water savings since 1993 due to the construction of the Wimmera–Mallee and Northern Mallee pipelines. Diversions were 94% below the long-term Cap of 159 GL/year. The cumulative Cap credit since July 1997 to June 2010 is 159 GL.

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 issuing new entitlements.

Monitoring the effectiveness of water management policies is undertaken on an ongoing basis. No new capping policies were introduced in 2009–10, apart from adjusting for environmental flows according to the interim protocol. No new policies are proposed for 2010–11 as current 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, streamflow management plans 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:

- Broken bulk entitlements – amended for decommissioning of Lake Mokoan on 28 November 2009
- Birch Creek bulk entitlements – completed in December 2009
- Wimmera bulk entitlements amendment – scheduled to be completed by December 2010
- Snowy Environmental Reserve – An environmental entitlement for the Snowy Environmental Reserve was granted in June 2004. To date 37.2 GL of high reliability savings has been transferred from the Murray and 20.4 GL from the Goulburn.
  The volume of environmental entitlements in these bulk entitlements will be increased as other water savings projects are undertaken.
- The Living Murray – Water recovered under The Living Murray initiative has been transferred into environmental entitlements in the Murray, Goulburn, Campaspe and Broken Creek systems. To date the following entitlements have been transferred:
  - Murray – 5.7 GL high reliability and 98.8 GL low reliability
  - Broken Creek – 3 GL low reliability
  - Goulburn – 39.6 GL high reliability and 157 GL low reliability
  - Campaspe – 126 ML high reliability and 5.1 GL low reliability

Streamflow management plans

The Victorian Government's Our Water Our Future set the strategic direction for where streamflow management plans are required to improve environmental flows by reducing summer low-flow stress. These plans set 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, e.g. 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 granting new licences. Each streamflow management plan 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 the *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.

The Upper Wimmera River is currently managed under sustainable diversion levels and is a capped system. New water allocation will only occur through savings associated with the Wimmera–Mallee Pipeline and through water trading.

Through the development of the Northern Sustainable Water Strategy, priority rivers for streamflow management plans in northern Victoria were reassessed. The integrated surface water and groundwater management plan for the upper Ovens River is currently underway. Management plans were proposed for the Yea River and King Parrot Creek but have been postponed due to the February 2009 bushfires which significantly affected the hydrology, ecology and communities of these catchments.

Local management rules are proposed for the remaining five rivers. These will publicise and formalise the existing management arrangements and management of environmental flows, including rosters and restrictions.

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 as well as exchange rates to ensure that the MDBA Cap is preserved when licences are traded.

Over 6,000 catchment dams in the Murray–Darling Basin, south of the Murray River, have been licensed. New licence applications for catchment dams are subject to the MDBA Cap and new developers are required to purchase an existing entitlement before approval is provided.

Through the Northern Region Sustainable Water Strategy (2009), Victoria has introduced a policy that requires all new or altered domestic and stock dams on properties of less than eight hectares (20 acres) in surrounding urban areas to be registered. This will help track the growth in domestic and stock water use. Victoria will commence a review of domestic and stock water management after the release of the draft Murray–Darling Basin Plan.

Northern Victoria Irrigation Renewal Project

Victoria is focused on improving the efficiency of irrigation delivery systems from about 70–85%. 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 water infrastructure projects announced as part of its Our 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.

In late 2007, the Victorian Government appointed a community-based steering committee to consult the community in northern Victoria and recommend how best to deliver the project and achieve the savings. The government has carefully considered the steering committee's recommendations, and as part of its response created a new state-owned enterprise for irrigation modernisation, the Northern Victoria Irrigation Renewal Project, to deliver this landmark project.

The Northern Victoria Irrigation Renewal Project is working closely with Goulburn–Murray Water, irrigators, shire councils and other stakeholders to optimise benefits for the region.

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/year over the long term.

The Commonwealth Government has given in-principle agreement to fund up to $952.8 million for Stage 2 of the Northern Victoria Irrigation Renewal Project, subject to due diligence. Stage 2 could secure about 200 GL of water savings to be shared equally between irrigators and the environment. Victoria proposes to reduce the Cap when water recovered by this project is transferred to the environment.

Measures proposed during next year

Proposed refinements to the management of the Cap in 2010–11 include:

- A Cap model for the Wimmera–Mallee Valley expected to gain MDBA approval by June 2011.
- Creating a new environmental entitlement in recognition of historic practices using unregulated flows for delivery to areas of environmental importance such as the Gunbower Forest, Hattah Lakes and the Lindsay–Wallpolla areas.

An environmental entitlement of a maximum 40 GL is proposed, subject to further modelling. A portion of the 40 GL could be counted within the Cap.

Victoria will examine this issue further and develop a proposal in 2010–11.

The IAG supports the proposed refinements, particularly where the practice was in place before 1993–94, and notes that a formal report will be submitted in 2010–11.

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 Victoria's commitment to working with the MDBA and the other Basin states to implement the Murray–Darling Basin Cap and The Living Murray initiative.

4.2.4 IAG assessment

In 2009–10 diversions in all valleys were below the Cap target for the year and all valleys have a cumulative Cap credit since 1 July 1997.

Victoria continues to refine models and inputs. In 2009 the Campaspe Valley model was amended to revise the river transmission loss so that it operates satisfactorily for a wider range of hydrological conditions. The approved updated model was used to derive 2009–10 Cap targets and the cumulative credits. As a result of revised model input data, the 2008–09 Cap target for the Goulburn/Broken/Loddon valley was 76 GL less than the 771 GL reported last year. Similarly, revised input data reduced the 2008–09 Cap target for the Campaspe Valley by 1 GL to 124 GL.

The Murray/Kiewa/Ovens accredited model was further updated in 2009–10 to correct small errors in the restrictions of water use in dry years. The latest version of the model was used to calculate the 2009–10 Cap targets and cumulative Cap credits to June 2010. As a result of the drought, flows to the Lindsay River were constrained in 2008–09 and 2009–10. This raises the issue as to whether the Cap should be adjusted. The IAG proposes to address the generic issue of drought and low-flow impacts on models and Cap targets in a separate report, and will establish a set of principles.

The Cap model for the Wimmera–Mallee Valley has been submitted for accreditation. As a result of revised model input data for May and June 2010, the Cap target changed slightly compared to the figures reported last year.

Victoria has in 2009–10 adjusted the Cap targets for environmental entitlements arising from initiatives such as The Living Murray. The method used, based on reducing the Cap environmental water, has been submitted to MDBA for approval.

The IAG notes that Victoria proposed further refinements to the Cap and Cap management including:

- finalising approval of the Cap model for the Wimmera–Mallee Valley, and
- formalising a proposal to create an entitlement for environmental water taken from unregulated flows for strategic environmental assets such as Gunbower Forest, Hattah Lakes and the Lindsay–Wallpolla areas.

Victoria continues to apply itself to the successful implementation of, and compliance with, the Cap.

The IAG acknowledges the full and clear data presented on water use and Cap compliance.

4.2.5 Conclusions and recommendations

- Diversion in 2009–10 were 1,810 GL compared to 1,503 GL in 2008–09.
- Diversions for the Murray/Kiewa/Ovens, Campaspe, Goulburn/Broken/Loddon and Wimmera–Mallee valleys in 2009–10 were below annual climate, environmental use and trade-adjusted Cap targets.
- Cumulative diversions since 1997 are in credit for all valleys.
- Victoria has accredited models for all valleys except the Wimmera–Mallee, for which a model has been submitted for accreditation and a decision is expected in 2010–11.
- Model modifications (approved) and changed inputs have resulted in changes to Caps and Cap credits for previous years.
- The updated models have been used to calculate 2009–10 Cap targets and the cumulative credits presented.
- Victoria has proposed a method for adjusting Caps on diversions for environmental entitlements and has applied this methodology to account for water recovered for the environment through initiatives such as The Living Murray. The protocol is expected to be approved by MDBA in October 2010.
- The IAG notes that Victoria proposes further refinements to the Cap including an entitlement for environmental water taken from unregulated flows. This would be subject to MDBA approval.
- Victoria continues to apply itself to the successful implementation of, and compliance with, the Cap.

4.3 New South Wales

4.3.1 The Cap

Assessment of Cap performance in New South Wales has been conducted on a valley-by-valley basis according to the requirements of Schedule E to the Murray–Darling Basin Agreement. Cumulative performance from 1997–98 relative to the Cap is assessed for all New South Wales 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 New South Wales, including the New South Wales' Murray and Lower Darling, Murrumbidgee, Lachlan, Macquarie, Namoi, and Gwydir valleys. Each plan sets in place a long-term diversion limit below Cap, and provides for a range of environmentally-focused water management rules. However, as reported in recent years and despite improved water availability in the second half of 2009–10, continued severe drought conditions, particularly in the southern valleys, resulted in the suspension of the water sharing plans and the adoption of special emergency arrangements for these valleys.

The annual Cap targets, and the long-term average Cap, are estimated in New South Wales using valley-scale hydrologic models that have been developed using the integrated quantity-quality model (IQQM) software developed by the New South Wales government. Hydrologic models have been developed using IQQM for all major regulated river systems within the New South Wales portion of the Murray–Darling Basin, with the exception of the New South Wales Murray and the Lower Darling valleys, which are modelled by the MDBA using the Murray simulation model.

The status of the various models used for annual Cap auditing in New South Wales is given in **Table 9** below.

The Murrumbidgee and Macquarie models are close to final accreditation which is expected to be completed in 2010–11. The models have been reviewed by the Cap model auditor and after some minor adjustments they are expected to be fully operational later in the 2010–11 water year.
The Barwon–Darling model has been recalibrated to recognise recent drought conditions, although this recalibration has yet to be accredited. Further recalibration may be required to reflect wet conditions, although this is not proposed at this time. However, the need for recalibration reflects the episodic nature of water availability for irrigation purposes in this valley.

Table 9: New South Wales Cap auditing: status of models

Valley	Auditing Tool	Comment
Murray / Lower Darling	Murray monthly simulation model (Final)	Approved for use under Schedule E / To be reviewed
Murrumbidgee	IQQM (Final)	Submitted for accreditation
Lachlan	IQQM (Final)	Approved for use under Schedule E
Macquarie	IQQM (Final)	Re-submitted for accreditation
Peel	IQQM (Final)	Approved for use under Schedule E
Namoi	IQQM (Final)	Approved for use under Schedule E
Gwydir	IQQM (Final)	Approved for use under Schedule E
Border Rivers	IQQM (Interim)	Model being prepared for submission
Barwon–Darling	IQQM (Final)	Preliminary results available

4.3.2 2009–10 usage

For New South Wales, the continuation of drought conditions has impacted on the availability of water for consumptive use and thus the performance of individual valleys against the valley Cap.

Of note this year are:

- Water sharing plans for the New South Wales Murray, Lower Darling, Murrumbidgee, Lachlan and Macquarie valleys remain suspended due to continuing drought and the need to make special arrangements to secure critical human needs.
- Cap targets have been changed for the New South Wales Murray and Lower Darling, following small corrections made to the model in the last year. These changes, together with some changes made before reporting for 2008–09, are not yet accredited.
- The Barwon–Darling integrated quantity-quality model (IQQM) has been recalibrated to reflect the impact of drought conditions on simulated diversions, which has resulted in the combined Barwon–Darling and Lower Darling valley coming back within the trigger for special auditing.
- A proposed Cap for the New South Wales Border Rivers was put forward for consideration during 2009–10. This Cap is based on 1993–94 infrastructure and management rules in New South Wales and Queensland, but includes a level of irrigated cropping on the modelling and memorandum of understanding signed with water users before the start of the Pindari Dam enlargement. This level of cropping is assumed to be represented by the levels observed during 1999–00.

Table 10 provides a summary of New South Wales diversions by river valley. This table provides diversions, Cap targets and trade adjustment for 2009–10, along with accumulated credit or debit. The valley diversions include estimated unregulated stream usage and these estimates have also been added to the Cap targets. Some amendments have been made to the Cap targets, and accumulated credits or debits from previous years based on refinements and recalculation of the models.

Table 10: New South Wales annual Cap accounting 2009–10

System	Long-term diversion Cap	2009–10 Cap target	Net trade from valley	Environ. water use	2009–10 diversion	Cap credits (Target less diversion)			Trigger exceeded	Storage difference
						2009-10	Cumula-tive since July 97	20% schedule trigger		
Barwon–Darling	198	147	0	n/a	145	2*	–138	–40	Yes	n/a
Lower Darling	133	77	21	48	11	–2	150	–27	No	238
Combined Barwon–Darling and Lower Darling	331	224	21	n/a	156	0	12	–66	No	238
Intersecting Streams	n/a	n/a	0	n/a	3	n/a	n/a	n/a	n/a	n/a
Border Rivers	n/a	n/a	9	n/a	115	n/a	n/a	n/a	n/a	n/a
Gwydir	342	70	0	n/a	57	13	170	–68	No	–34
Namoi/Peel	243	238	0	n/a	172	66	220	–49	No	30
Macquarie/ Castlereagh/Bogan	443	115	0	n/a	109	5	340	–89	No	–95
Lachlan	307	61	0	n/a	26	36	163	–61	No	–88
Murrumbidgee	2,568	868	111	10	855	–108	1,317	–514	No	–627
New South Wales Murray	1,908	1,032	76	16	439	501	654	–382	No	–716
TOTAL	**6,142**	**2,608**	**216**	**n/a**	**1,932**	**514**	**2,876**	**–1,229**		

• All volumes are shown in gigalitres (GL); n/a indicates estimate is not available
• A positive difference indicates a Cap credit, and a negative difference indicates a Cap debit
• Long-term diversion Caps do not include floodplain harvesting components to maintain consistency with observed diversions
• A positive storage difference represents a potential Cap credit in future water years
• Net trade from the New South Wales Murray valley includes cumulative permanent trades to other states since 1 July 1997
* Barwon–Darling credit likely to be a debit once environment adjustment is made for Toorale

Valley-by-valley resource availability

Though better than the previous year, water availability in 2009–10 remained at low levels.

Table 11 provides an indicative summary of the water availability for the 2009–10 year. It is evident from this table that, except for a few northern valleys, notably the Border Rivers, Peel and Lower Darling, allocations were quite low. For the Murrumbidgee and Murray valleys in the south, where most diversions take place in New South Wales, total water availability including carryover did not exceed 43%.

Table 11: New South Wales general security allocations during 2009–10

Valley/system	General security allocation (%)		Carryover from last year
	Beginning of 2009–10	End of 2009–10	
Border Rivers			
– Class A	1%	100.0%	30%
– Class B	5.6%	10.0%	–
Gwydir system	0%	0.0%	8%
Namoi system	0.0%	0.6%	24%
Peel system	80%	100.0%	–
Manilla system	50%	50.0%	–
Macquarie system	0%	0.0%	10%
Cudgegong system	0%	0.0%	50%
Lachlan system	0%	0.0%	0%
Belubula system	0%	0.0%	0%
Murrumbidgee system	0%	27.0%	16%
Lower Darling system	0.0%	100.0%	17%
Murray system	0%	28.3%	15%

Cap compliance

Murray Valley

Cap compliance for the regulated sections of the Murray Valley has been assessed using the Murray simulation model that has been accredited for use. Cap modelling excludes all Snowy borrows, which has the effect of reducing the current Cap credits.

The Schedule E accounting for the 1997–98 to 2009–10 water years indicates that the New South Wales Murray Valley is cumulatively 654 GL below Cap, which is a significant increase on results reported last year. The observed storage levels at 30 June 2010 were 716 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 716 GL of Cap debits would be generated.

The cumulative credit of 654 GL implies that diversion from July 1997 have been 3.9% below Cap.

Murrumbidgee Valley

Representation of diversions into the Lowbidgee district is included within the Murrumbidgee integrated quantity–quality model (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 E accounting for the 1997–98 to 2009–10 seasons indicates that the total Murrumbidgee Valley is cumulatively 1,317 GL below Cap. Despite recalibration of losses in the Murrumbidgee IQQM over recent years, the high river transmission losses that have been observed continue to be underestimated by the model, which has the effect of increasing Cap credits. The results presented here are yet to fully include drought management rules within the Cap model. Modifications to the model to meet this requirement are expected to be accredited in 2010–11.

The observed storage levels at 30 June 2010 were 627 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 627 GL of Cap debits would be generated.

The cumulative credit of 1,317 GL implies that the Murrumbidgee Valley has been 5.6% below Cap since July 1997.

Lachlan Valley

The Lachlan integrated quantity–quality model (IQQM) Cap scenario modelling has been independently audited and approved for use under Schedule E of the Murray–Darling Basin Agreement. Schedule E accounting for the 1997–98 to 2009–10 seasons indicates that the Lachlan Valley is cumulatively 163 GL below Cap, although the Cap model does not include representation of the drought management rules. The observed storage levels at 30 June 2010 were 88 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 88 GL of Cap debits would be generated.

The cumulative Cap credit of 163 GL implies that the Lachlan Valley has been 6% below Cap since July 1997.

Macquarie Valley

The Cap for the regulated sections of the Macquarie Valley has been audited using the Macquarie Valley integrated quantity–quality model (IQQM) that has been recommended for re-accreditation by the independent reviewer.

The Schedule E accounting for the 1997–98 to 2009–10 seasons indicates that the Macquarie Valley is cumulatively 340 GL below Cap although the Cap model does not include drought management rules. The observed storage levels at 30 June 2010 were 95 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 95 GL of Cap debits would be generated.

The cumulative Cap credit of 340 GL implies that the Macquarie Valley has been 8% below Cap since July 1997.

Namoi/Peel Valley

The Namoi Valley consists of three distinct systems: the main Lower Namoi Valley, the smaller Peel River system and Manilla River/Upper Namoi system.

The Namoi integrated quantity–quality model (IQQM) Cap model (covering both the Namoi and Manilla/Upper Namoi systems) has been independently audited and approved for use under Schedule E of the Murray–Darling Basin Agreement. A Peel IQQM Cap model has also been accredited by the MDBA for use under Schedule E of the Murray–Darling Basin Agreement. Diversions for the combined valleys are below the annual Cap targets since 1997–98 by a cumulative total of 220 GL. The observed storage levels at 30 June 2010 were 30 GL lower than those simulated under Cap conditions. If this stored water is used before the storage next spills, 30 GL of Cap credits would be generated.

The cumulative Cap credit of 220 GL implies that the Naomi/Peel Valley has been 6.3% below Cap since July 1997.

Gwydir Valley

The Cap for the regulated sections of the Gwydir Valley has been audited using the Gwydir integrated quantity–quality model (IQQM) that has been accredited under the provisions of Schedule E. The results indicate that diversions are cumulatively 170 GL below Cap since 1997–98. The observed storage levels at 30 June 2010 were 34 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 34 GL of Cap debits would be generated. The cumulative Cap credit of 170 GL implies that diversions from the Gwydir Valley have been 4.7% below Cap since July 1997.

New South Wales Border Rivers Valley

An intergovernmental agreement on water sharing arrangements in the Border Rivers has been signed by the New South Wales and Queensland premiers. The agreement limits each state to the long-term diversion resulting from 2002 levels of development, with the application of the environmental flow rules described in the agreement. Subject to agreement on floodplain harvesting, this is estimated to provide an end-of-system flow at Mungindi of around 61% of the natural flow.

The provisions of the intergovernmental agreement are embedded in the water sharing plan for the New South Wales Border Rivers, (and referred to in the resource operations plan for Queensland), which commenced in July 2009. Modelling indicates that this results in a plan limit (on diversions) of around 191 GL/year for the New South Wales Border Rivers regulated system. This is approximately 4% below the long-term average diversions under the Cap that is to be proposed by New South Wales.

New South Wales and Queensland have now agreed on modelling that describes state shares. New South Wales has proposed an allowance for enlarging Pindari Dam. It is expected that a Cap model will be submitted for accreditation, subject to approval of the proposed allowance for the Pindari Dam by the Murray–Darling Basin Ministerial Council. The IAG has prepared a separate report (*New South Wales Border Rivers Cap proposal: IAG assessment, October 2010*) on the proposed Cap for the Border Rivers and the allowance for the Pindari Dam.

Intersecting Streams

The Warrego, Paroo, Culgoa, Narran and Moonie rivers flow across the New South Wales–Queensland border, and reaches of these rivers that are within New South Wales are designated as the Intersecting Streams Valley under Schedule E to the Murray–Darling Basin Agreement, for Cap accounting purposes. Presently, no Cap has been formally established for these rivers, and usage is not monitored. However, macro water sharing plans for unregulated areas within New South Wales are currently being established, which will:

- facilitate conversions of licences to the new *Water Management Act 2000*
- provide a framework for establishing Caps, and
- allow 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 to the unregulated areas of other valleys. New South Wales advised that its macro-planning project on these streams is likely to be completed, allowing a Cap for these streams to be specified, by the end of 2010–11.

Schedule E accounting is not currently available for the Intersecting Streams. There are 18 GL of entitlements associated with the New South Wales Intersecting Streams and the estimated usage of 3 GL last year is based on a survey conducted in 2000.

Some of the entitlement from the Warrego River was purchased by the New South Wales Government with significant funding assistance from the Commonwealth as part of the Toorale property acquisition. Given the estimated low level of usage of the existing entitlements, Cap adjustments for use of the Commonwealth Environmental Water Holder entitlement will need to be considered.

Barwon–Upper Darling Valley

Major flood flows in southern Queensland, together with more modest inflows from New South Wales tributaries, have provided significant inflows to the Barwon–Darling system in 2010. The total volume of extractions in 2009–10 was 145 GL.

New South Wales has implemented a new Cap strategy, similar to those applied in other unregulated streams in the state, to ensure Cap compliance in the Barwon–Darling Valley. The restructured water entitlements and access rules have operated since 2007, and are designed to ensure that long-term average diversions do not exceed the long-term Cap. It is acknowledged, however, that, as the Barwon–Darling is an unregulated river, water availability will vary significantly between years. Similarly, annual diversions will vary, with higher than average diversions in some years and lower than average diversions in others. The Cap arrangements applied from 1 July 2007 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 (173 GL),
- unlimited carryover of allocated water from one water year to the next, and the introduction of a trading framework.

In addition to these arrangements, New South Wales has indicated that it would further reduce water made available each year from 173 GL to 143 GL as a next step if there continued to be a trend towards increasing Cap debits. New South Wales has also indicated that it may be prepared to place three-year rolling average caps on the diversion of water as a means of reducing diversions more quickly than might otherwise occur under their existing Cap arrangements. New South Wales proposes to review the Cap modelling now available and consider if this proposed reduction in water availability remains appropriate.

New South Wales is developing 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. This plan is a priority for New South Wales.

The Barwon–Darling integrated quantity–quality model Cap scenario has been recalibrated over the last 12 months, to better reflect simulation of diversions during very dry periods. This resulted in the total annual Cap targets for the Barwon–Darling since 1997–98 increasing by 13%. Further recalibration is envisaged when sufficient information is available from the new meters that are operating concurrently with the existing time-event meters.

Results are considered preliminary at present until the model is independently audited under the provisions of Schedule E of the Murray–Darling Basin Agreement. The modelling also includes the impact of restricted access during some unregulated events to ensure that sufficient flows reached Menindee Lakes to provide critical water supplies to Broken Hill. This has occurred in the Barwon–Darling Valley in a number of years since 1997–98.

The modelling of Cap targets for the Barwon–Darling Valley has used observed tributary inflows, rather than the simulated outflows from upstream Cap models. This has been done for a number of reasons, including delays in modelled inflows from Queensland and the Border Rivers, the need for additional modelling in some cases where the upstream valley model does not simulate flows all the way to the Barwon–Darling (e.g. Macquarie Valley), and issues associated with the accuracy of modelled end-of-system flows.

Based on these operating rules, diversions in 2009–10 were kept within the climate-adjusted Cap estimate for the year, generating a small annual credit. However this calculation does not include any adjustment in 2009–10 for the allocation of water to the environment resulting from the use of Toorale water allocation by the Commonwealth.

The cumulative Cap debit on this valley of 138 GL exceeds the trigger if the valley was considered alone rather than combined with the Lower Darling. This debit indicates that the Barwon–Darling is 7.3% over 1993–94 levels of development.

Lower Darling Valley

The Cap for the regulated sections of the Murray Valley has been audited using the Murray simulation model. However, the independent model auditor has recommended either further work to improve the quality of the model's calibration, or that the required standards are reviewed. The main issue is the ability to model the recorded behaviour of the largest single irrigation enterprise in the Lower Darling at Lake Tandou. Despite more specific representation of physical processes in the model to simulate irrigation operations at Lake Tandou, consistent calibration of the six largest diversions has not been possible. Despite further work by the MDBA on the simulation model, New South Wales believes more work is needed to better define 1993–94 irrigation activities at Lake Tandou. This work has not been advanced significantly during 2009–10.

The modelling of Cap targets for the Lower Darling Valley has used observed inflows at the Menindee Lakes, rather than the simulated outflows from the upstream Cap model. This has been done primarily because issues associated with the accuracy of modelled end-of-system flows have been raised by MDBA. Currently, the Barwon–Darling model overestimates the end-of-system flows by a considerable margin, and the use of modelled Menindee inflows would affect the annual Cap targets for the Murray and the Lower Darling.

Preliminary Schedule E accounting for 1997–98 to 2009–10 indicates that the Lower Darling Valley is cumulatively 150 GL below Cap. This implies that diversions have been 13.5% below Cap since July 1997.

Combined Barwon/Upper Darling and Lower Darling Cap accounting

The preliminary Schedule E accounting for the 1997–98 to 2009–10 period indicates that the cumulative actual diversions in the combined Barwon–Darling and Lower Darling valleys are 12 GL below the cumulative annual diversions targets — a turnaround on the result reported in 2008–09 where a special audit was triggered. This turnaround largely reflects the revised modelling results used for this combined valley. The modelling results provided are the best that are available at this time.

The IAG notes that the variability in the performance of this combined valley in recent years has been the subject of some debate. There is some concern about the ability of the current Barwon–Darling Cap arrangements to achieve a return to a balanced Cap outcome in the foreseeable future. The IAG notes the action and further action foreshadowed by New South Wales. It is keen to see modelling for this valley, in particular, completed and accredited to assure all parties that the valley will remain within Cap under the current management rules.

Diversions in unregulated river systems

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

Unmetered use estimates are taken from the volumetric conversion process (2000) based on crop areas survey and assessed irrigation requirements. The estimated average use over the years 1993–94 to 1998–99 is presented in **Table 12** (column 2).

Metered use totals are from time-event meters as used in the Barwon–Darling system.

New South Wales intends to Cap unmetered users according to the average 1993–94 to 1998–99 diversion estimate arising from the volumetric conversion process, although this process has yet to be completed.

Estimates of unregulated stream usage (both metered and unmetered) have been included in the diversions reported in **Table 12** and have been added to the Cap targets generated by the models. Unfortunately metered data is not currently available for 2009–10.

Table 12: Unregulated use in New South Wales

	unmetered use (estimates)	Metered use												
		1997–98	1998–99	1999–00	2000–01	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2009–10	2009–10
Murray	28	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower Darling	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barwon-Darling		0	0	0	0	0	0	0	0	0	0	0	0	0
Murrumbidgee	42	0	0	0	0	0	0	0	0	0	0	0	0	0
Lachlan	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Macquarie	35	3	22	16	21	15	0	9	3	10	1	9	3	n/a
Namoi	78	0	0	0	0	0	0	0	0	0	0	0	0	0
Gwydir	10	1	1	4	0	2	0	0	2	1	0	0	0	n/a
NSW Border Rivers	14	0	4	2	2	2	0	5	3	4	0	5	7	n/a
Intersecting Streams	3	0	0	0	0	0	0	0	0	0	0	0	0	0

4.3.3 Monitoring and reporting

New South Wales has submitted models for seven of its nine designated Cap valleys for audit. Five have been approved by the Authority and the remaining two are in the process of being audited and accredited. The accreditation process for the Murrumbidgee and Macquarie integrated quantity-quality models (IQQM) is expected to be completed within the next 12 months, with only minor work still required on the Macquarie model.

While it is hoped that the recalibration of the Barwon–Darling and Lower Darling models may be completed in 2010–11, constraints with available technical expertise and the need to examine issues associated with the operation of the model in wetter periods, may further delay its completion.

The IAG has considered a Cap proposal for the Border Rivers and subsequently issued the *New South Wales Border Rivers Cap proposal: IAG assessment, October 2010,* report.

The IAG notes that New South Wales water sharing plans have continued to be suspended during this time of exceptional drought conditions. Effectively this allows New South Wales to take action outside of these plans to ensure water is available for household and livestock users, particularly in highly constrained valleys.

4.3.4 Administration of the Cap

New South Wales relies primarily upon its water sharing plans to ensure that the Cap requirements are met. The record drought conditions, particularly in the southern New South Wales valleys, have resulted in the continued suspension of regulated water sharing plans for the New South Wales Murray, Lower Darling, Murrumbidgee, Lachlan and Macquarie/Cudgegong valleys. This has allowed critical drought relief measures to be continued, including:

- suspending access to water in individual users' accounts to ensure supply to critical urban and industrial users
- suspension of most environmental releases
- making individual allocations to critical industrial users and permanent plantings on a month-by -month basis
- suspension of flows into some effluent creek systems
- new accounting arrangements for users (carryover for high security users, lifting of trade restrictions), and
- limits to supplementary flows in the Namoi and Gwydir valleys.

The impacts of record low inflows to many valleys have continued into the start of the 2009–10 year, and contingency measures to ensure water security for higher priority water users, such as towns and intensive use industries, were in place at the start of the year. However, water availability significantly improved in 2010, including flood flows from the Paroo and other intersecting steams that nearly filled Menindee Lakes. Autumn rainfall elsewhere in New South Wales was also the best since 2005 in many areas.

New South Wales will revert to the water sharing plan arrangements once the immediate drought crisis has passed.

4.3.5 IAG assessment

With ongoing, extreme drought conditions through the first half of 2009–10, New South Wales has continued to operate its valleys to meet high priority needs under arrangements that, in many valleys, involved suspending water sharing plans.

For all valleys for which formal modelling of Cap limits have been undertaken using accredited models, diversions have been within the Cap for 2009–10 and remain within the cumulative Cap from 1 July 1997. While Murrumbidgee diversions were above the annual climate-adjusted Cap for 2009–10, it remains in cumulative Cap credit since 1997–98.

For the Barwon–Darling, revisions to interim modelling have resulted in a small annual Cap credit for 2009–10, although no allowance has been made for water recovered for the environment in the estimates provided at the time of this review, and in particular, the accounting of Toorale water purchased by New South Wales with funding assistance from the Commonwealth. The Barwon–Darling model has not yet been submitted for audit and review under the provisions of Schedule E. Until that occurs it is not possible to comment upon the suitability of the amendments that have been made to the model since the 2008–09 IAG review.

However, it is noted that as a result of the revisions to the model, which purportedly address the issue of an extended period of drought years, the cumulative Cap debit for this valley has fallen from 347 GL as at 30 June 2009 to 138 GL debit as at 30 June 2010. This was despite the diversions in 2009–10 remaining at a level commensurate with that reported for the 2008–09 water year. Furthermore, it is noted that 2009–10, being somewhat wetter than previous years, did not result in a significant reduction in the diversions in this valley. New South Wales had previously argued that during wet years it could be expected that diversions would be reduced as part of the averaging out process that, under the water sharing plan, is intended to ensure that overall diversions do not exceed 173 GL per annum.

As a consequence of the revised model outcomes for the Barwon–Darling, the combined Barwon–Darling/Lower Darling no longer exceeds the trigger for a special audit that applies to this combined valley. The IAG notes that New South Wales has made various statements and commitments concerning action that it would take to address what appeared in previous audit reviews to be a breach of the Cap. Notwithstanding the outcome reported for the latest year based on the revised Barwon–Darling interim model, the IAG has a continuing concern about the long-term Cap position of this valley. Accordingly, it re-emphasises the need for the formal review and accreditation, if appropriate, of the model used for the Barwon–Darling to remove any concerns about the performance of this valley over time.

In discussions with New South Wales, the issue of the accounting for the transfer of water to environmental uses has been reviewed. New South Wales made preliminary adjustments in its reporting for 2008–09 to reflect water that has been allocated to The Living Murray, for example. However, at the time data was initially provided to the IAG for the 2009–10 annual audit, no adjustment had been made for environmental water use in the New South Wales estimates — partly an issue of the timing of the audit visit. New South Wales has undertaken to make some adjustments to the diversion and Cap numbers to account for environmental use, which will reduce any Cap credits that were initially shown in data provided to the IAG.

There is an issue with the timing of the completion of the IAG audit, which may need to be considered further in the context of the timing of reports to the Ministerial Council. The IAG has been prepared to accept best estimates where final figures are not available, recognising that the final figures will be provided in subsequent publications, including the updating of tables in the next year's IAG report. However, when reporting to Council, the IAG needs to acknowledge and potentially highlight instances where there is some concern about the veracity of the estimates used, particularly when a valley may be close to breaching the special audit trigger. For New South Wales in 2009–10, there is no suggestion that the final environmental use estimates are likely to change the general conclusion regarding its meeting the cumulative Cap requirements in 2009–10. (The IAG notes its observations concerning the Barwon–Darling above).

4.3.6 Conclusions and recommendations

- Diversions in 2009–10 were 1,932 GL compared to 1,729 GL in 2008–09.
- Cap models have been approved for five New South Wales valleys and are currently being audited for two of the remaining four New South Wales valleys.
- Cumulative Cap credits exist for all valleys in New South Wales with the exception of the Barwon–Darling, although cumulative Cap credit exists for the combined Barwon–Darling and Lower Darling Valley.
- On the basis of preliminary modelling data, the Barwon–Darling/Lower Darling Valley does not appear to have exceeded the trigger necessitating a special audit. Pending formal consideration and accreditation of the Barwon–Darling model, it is not possible for the IAG to say that the long-term trend in diversions on the Barwon–Darling has been addressed, and accordingly New South Wales is encouraged to submit this model for accreditation as soon as possible and thereby allow full transparency of the results generated.
- The IAG has been unable to assess the Cap compliance of the New South Wales Border Rivers because a Cap has still not been proposed; however, a Cap proposal for the Border Rivers along with an allowance for the enlarged Pindari Dam has been submitted for IAG assessment. This is discussed further in a separate IAG report, *New South Wales Border Rivers Cap proposal: IAG assessment, October 2010* .
- New South Wales is encouraged to complete the review and accreditation of the Macquarie and Murrumbidgee Cap models for use under Schedule E by the end of 2010 so these models can be formally used for the 2010–11 audit review.
- Water sharing plans, which are the main instrument used by New South Wales to ensure compliance with the Cap at a valley level, continue to be suspended for the New South Wales Murray, Lower Darling, Murrumbidgee, Lachlan, and Macquarie/Cudgegong valleys. With improved rainfall outcomes and outlook in late 2009–10, it is likely that this suspension will be lifted in 2010–11.
- New South Wales needs to advise the timing for the proposed capping of unregulated streams, noting that the macro-planning project on Intersecting Streams is likely to be completed by the end of 2010–11.

4.4 Queensland

4.4.1 The Cap

The Queensland Cap is being established in accordance with the provisions of Schedule E to the Murray–Darling Basin Agreement following the completion of the water resource planning process.

Diversion caps have been approved for the Warrego, Paroo, Nebine, Moonie and Border Rivers valleys. Queensland has completed Cap target calculations for the Warrego, Paroo, Nebine, Moonie and Border Rivers valleys.

A Cap proposal for the Condamine–Balonne has been submitted to the MDBA. It will provide the basis for setting Cap targets and monitoring compliance in 2010–11.

The Queensland valley caps have been based on an extensive period of consultation and analysis undertaken across each valley. This has involved preparing water resource plans and, under the provisions of the *Water Act 2000* (Qld), developing a resource operations plan for each valley 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 operating plans.

Usage in all Queensland valleys is now reported for a 12 month water year running from July to June.

Administrative holds on the issuing of new licences have been in place in all Queensland Murray–Darling valleys since before March 1995. Major sections of the Lower Balonne have had administrative holds in place since October 1991, and other sections, including most of the Border Rivers, since 1992. Following the introduction of the *Water Act 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 on taking water, other than for stock and domestic purposes, also applied to new overland flow works since September 2000 (Condamine and Balonne and Border rivers) and June 2001 (all other valleys).

Accreditation of Cap models for the Warrego, Nebine, Paroo and Moonie valleys is complete and the first full Cap audit for these valleys was undertaken for the 2006–07 water year. The integrated quantity–quality model (IQQM) for the Border Rivers has been submitted for accreditation. The Cap model for the Condamine and Balonne system will be submitted in 2010–11 for accreditation.

4.4.2 2009–10 diversions

The summer period (November 2009–March 2010) resulted in above average rainfall in many parts of the Queensland section of the Murray–Darling Basin. Annual rainfall was above average in Queensland's western Murray–Darling Basin catchments, but below average in the eastern catchments.

A key feature of the 2009–10 summer was the continuity of flow that occurred due to multiple rainfall events occurring in December 2009 and February and March 2010. The main events included:

- December 2009 – tropical cyclone Laurence caused a low pressure system to bring heavy rainfall and streamflows to central and western Queensland.
- In January 2010, the Warrego, Paroo, Moonie, Border Rivers and Maranoa (sub-catchment of the Condamine and Balonne) catchments experienced minor to moderate flooding as a result of continued rainfall.
- In early February 2010 tropical cyclone Olga caused moderate to heavy rainfall, leading to major flooding in the Condamine and Balonne rivers and continued moderate flooding in the Paroo and Warrego rivers.
- An exceptional monsoonal rain influence over parts of Queensland and the Northern Territory brought two days of rainfall on 1–2 March 2010, with totals exceeding 100 mm/day, the largest area of 100 mm plus daily totals in the Australian meteorological record. This level of rainfall on an already wet catchment brought record peak floods to all but one of the Queensland Murray–Darling Basin catchments.

The 2009–10 water year resulted in record river flows:

- Paroo River – record floods above Hungerford near the New South Wales border with flows peaking at 153 GL/day at Caiwarro.
- Moonie River – highest flooding on record in the lower reaches.
- Warrego River – record highest flooding in the township of Charleville, with regional flooding highest since 1990.
- Maranoa River – highest flooding in 20 years.
- Balonne River – record highest flooding in the township of St George, likely the highest flooding for 120 years.
- Upper Condamine River – substantial flows but no flooding

- Border Rivers – the only Queensland catchment in the Murray–Darling Basin not to experience major flooding during this period, with flooding only in the lower reaches upstream of Mungindi due to significant flows in the Weir River.

Rain eased in April, although flooding continued in the Balonne River system until late in the month. Rainfall in May and June 2010 was generally below average across the Queensland Murray–Darling Basin catchments.

The continuous flows in most of Queensland's streams through summer and beyond provided exceptional water harvesting and overland flow harvesting opportunities, particularly in the Balonne, with total diversions in the Queensland Murray–Darling Basin estimated at 1,229 GL, 78% of which was taken from the Lower Balonne. The record flooding in March 2010 in particular, provided exceptional overland flow harvesting opportunities with a total of 398 GL taken in the year, 94% of which was taken in the Lower Balonne.

Diversions are comprised of two components: diversions from streams, and overland flow harvesting. **Table 13** summarises the stream diversions from the Queensland Murray–Darling Basin catchments and the annual flow volumes for 2009–10 measured at key sites. Flows were generally well above average long-term figures, except in the upper reaches of the Condamine and the Border rivers. The high stream flow has resulted in the second highest stream diversion figures since recording began in 1993.

Table 13: Summary of stream diversions for Queensland catchments 2009–10

Valley	Flow 2009-10 (GL)	Mean annual flow (GL)	Diversion 2009-10 (GL)
Condamine and Balonne			
Condamine (Chinchilla)	198	509	64
Condamine/Balonne (Weribone)	2,496	1,092	18
Maranoa (Cashmere)	588	127	2
Lower Balonne (St George)	3,640	1,072	587
Border			
Granite Belt (Farnbro)	4	74	4
Macintyre/Barwon (Goondiwindi)	193	732	78
Weir (Talwood)	182	138	36
Moonie (Fenton)	472	148	28
Nebine (Roseleigh)	110	Only gauged since 2007	<1
Warrego (Cunnamulla)	1,839	473	12
Paroo (Caiwarro)	2,040	553	<1
		TOTAL	**831**

Stream diversion across all catchments is estimated to be 831 GL, comprising a combination of supplemented diversion (take from regulated flow associated with public storages under the authority of a water allocation) and unsupplemented diversion (taken primarily from water harvesting activities).

Overland flow, in the form of upland flow capture, on-farm rainfall runoff and floodplain diversions are not included in the above figures. Overland flow diversion has been assessed either from modelling or regional appraisal in the key areas where water harvesting and floodplain diversion operate together and it has been estimated that a further 398 GL of diversion has occurred. Total diversions across all catchments from streams and overland flow for 2009–10 are estimated to be 1,229 GL.

Diversions in Queensland are highly variable owing to the ephemeral nature of flow in its streams. For example, the 2009–10 stream diversion of 831 GL contrasts distinctly with the 321 GL stream diversions for 2008–09.

Table 14 shows stream diversion levels for the total Queensland Murray–Darling Basin catchments over the past 17 years. The 831 GL diverted in 2009–10 had an associated cross-border flow of 6,242 GL, comparing favourably with 2007–08, when 876 GL of water was diverted from streams in the Queensland Murray–Darling Basin catchments with 3,271 GL of water flowing into New South Wales.

Diversion in the Queensland Murray–Darling Basin is characterised by greater volumes of unsupplemented water compared to the quantity provided through water supply schemes (**see Table 15**). Overland flow take, in the form of floodplain harvesting, is based on estimates only.

As **Table 16** shows, the end-of-system flows from Queensland Murray–Darling Basin catchments for the year totalled 6,242 GL, compared with 391 GL in 2008–09, highlighting the extreme variability inherent in this part of the Basin.

The level of flow experienced across all catchments, except the Border Rivers, was well above average, resulting from the high rainfalls between December and March.

Public storages are comparatively few in both volume and number across the Queensland Basin valleys. Around one-third of these storages are used solely for urban supplies, with many of the other storages also used in part to supply urban needs.

Table 14: Queensland Basin stream diversions (GL)[1,2]

Report	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	306
14	2006–07	149
15	2007–08	876
16	2008–09	321
17	2009–10	831

[1]Water year reported before 2006 was 1 October to 30 September. Water year reported post 2008 is 1 July to 30 June.
[2] Does not include overland flow

Table 15: Water diversions by section (GL)

Unsupplemented	688
Supplemented	143
Overland flow	398
TOTAL	1,229

Table 16: Cross-border flows 2009–2010 water year (GL)

Valley	Cross border flow
Paroo	2,040
Warrego	1,839
Nebine	110
Condamine-Balonne	1,546
Moonie	472
Border	235
TOTAL	6,242

There was significant inflow into public storages in the western catchments during the 2009–10 water year. However storages in the eastern parts of the Basin did not benefit from the high rainfall and resultant streamflows, with Cooby Dam (near Toowoomba), Leslie Dam (near Warwick), Glenlyon and Coolmunda dams (west of Stanthorpe) all below 22% capacity at the end of the year. **Table 17** shows the level of storage at 30 June 2010.

4.4.3 Comparison of annual diversions with the annual Cap targets

Overview

The long-term diversion Cap was established for the Warrego, Paroo, Nebine and Moonie in May 2007. Cap targets for these rivers have been determined for the 2009–10 water year and are specified in **Table 18**. Cap targets have not been determined for the Border Rivers catchment at this point, as the hydrologic model for the catchment has not been extended for the 2009–10 year. The Condamine and Balonne Cap proposal was submitted to the MDBA in October 2010 and, subject to approval, reporting against Cap will commence in the 2010–11 water year.

To provide better estimates of Cap targets for the Border Rivers, further information from New South Wales is required to update Queensland's hydrologic model. An estimate of the Cap target has been derived from the recorded streamflows at different locations along the river. The long-term record was interrogated to provide the diversion of a year of the same magnitude of recorded streamflow. However, different years have been used for different parts of the catchment as this year the Weir River has had a relatively wet year while the remainder of the catchment has had below average annual total streamflow.

The estimated Cap target provided here will be updated with improved estimates when the Border Rivers model is updated with data provided by New South Wales.

Table 18 summarises annual diversions compared to Cap targets for the Queensland valleys. For those catchments where Caps have been approved, annual diversions are generally well below target diversions. As a consequence of the rules-based approach adopted in Queensland, diversions are compared with target diversions on an annual basis. There is no cumulative accounting of Cap credits or debits for the Warrego, Paroo, Nebine and Moonie catchments. For the Border Rivers, Moonie, Nebine valleys, overland flow harvesting is included in the long-term diversion Cap. For the Warrego and Paroo, these diversions are not included. In **Table 18**, observed overland flow diversions have been added to the modelled targets to allow consistent reporting.

Table 17: Public storages across Queensland valleys

Storage	Percent full at 30 June 2010	Full storage capacity	Notes
Condamine-Balonne			
Cooby Dam	10%	23 GL	Toowoomba urban water supply
Leslie Dam	9%	106 GL	Warwick urban water supply and Upper Condamine WSS
Connolly Dam	63%	2.4 GL	Warwick urban water supply
Chinchilla Weir	78%	10 GL	Chinchilla urban water supply and Chinchilla WSS
Beardmore	85%	81 GL	St George WSS
Jack Taylor Weir	88%	10 GL	St George urban water supply and St George WSS
Neil Turner Weir	100%	1.5 GL	Maranoa WSS
Border Rivers			
Storm King Dam	73%	2.4 GL	Stanthorpe urban water supply
Glenlyon Dam	22%	254 GL	Supports New South Wales/Qld supplemented water system
Coolmunda Dam	13%	69 GL	Macintyre Brook WSS
Warrego			
Cunnamulla Weir	100%	4.8 GL	Cunnamulla WSS

WSS refers to a supplemented water supply scheme operated by SunWater and where most of the water use is for irrigation.

Table 18: Annual diversions compared to Cap targets (GL)

System	Long-term diversion cap	This year's Cap target[2]	Overland flow (included in target)	Net trade from catchment	This year's total diversion	Cap credits (target less diversion)			Trigger exceeded	Storage difference
						2009-10 year	Cumula-tive since July 1997	20% schedule trigger		Simulated less observed
Warrego	47.9	94.5	3.5	0.0	15.4	79.1	n/a	n/a	No	n/a
Paroo	0.18	1.6	1.5	0.0	1.57	0.03	n/a	n/a	No	n/a
Nebine[1]	6.4	9.7	0.1	0.0	1[3]	8.7	n/a	n/a	No	n/a
Moonie[1]	34.9	75.8	15	0.0	42.6[3]	33.2	n/a	n/a	No	n/a
Border Rivers (Qld)	250.3	156[5]	-	8.6	119.4[3]	45.2	73	-50	n/a	n/a
Condamine and Balonne	729[4]	n/a		0.0	1049	n/a	n/a	n/a	n/a	n/a
TOTAL	**n/a**	**n/a**		**8.6**	**1229**	**166**	**n/a**	**n/a**	**n/a**	**n/a**

1. Long-term diversion Caps include modelled overland flow component
2. Cap target includes estimated overland flow
3. Cap diversion target includes estimated overland flow
4. Cap proposal as submitted to MDBA in October 2010
5. Estimate of Cap target for the 2009–10 water year based on recorded streamflows at different locations in the Border Rivers as an indicator of the annual diversions

Warrego

Resource availability

Monthly rainfalls in October, December, February and March were significantly above average and total rainfall. For the 2009–10, rainfall recorded at Cunnamulla was 639 mm compared to an average annual rainfall of 370 mm.

Average annual flow at Cunnamulla is 473 GL. Streamflow for the Warrego River at Cunnamulla for the 2009–10 water year was a record 1,839 GL, 70% of which occurred in March. This surpassed the previous highest recorded flow of 1,765 GL in 2007–08 and is well in excess of the 2008–09 total of 44 GL.

The normal summer flow pattern in the Warrego River continued, with substantial flows in the months of January, February and March 2010.

Supplemented water diversion in this catchment is limited to the Cunnamulla Weir Water Supply Scheme. The scheme is based on conserving and supplying water allocations from a 4.7 GL weir on the Warrego River at Cunnamulla.

The announced allocation at the start of the 2009–10 water year from the Cunnamulla Weir Water Supply Scheme was 69%. The announced allocation was increased to 77% on 5 August 2009, and then to 100% on 23 November 2009.

Supplemented water diversion was 1.4 GL from an available entitlement of 2.6 GL.

The take of unsupplemented water within this catchment must be in accordance with stated flow conditions at a specified reference point. Diversion of unsupplemented water for the 2009–10 water year was 10.5 GL.

There were three announced periods to take unsupplemented water in the Lower Warrego Water Management Area for 2009–10. The first event commenced in the previous water year, and the third began in early January and continued into the next water year.

While most diversion works are equipped with water meters, metering the larger works has been deferred until national standards are finalised. The Department of Environment and Resource Management is intending to complete metering on these works in late 2010. Meters will be installed in accordance with manufacturer's specifications if pattern approvals are not available. Water use assessments are currently completed for each of these works.

Overland take from floodplain flows for the catchment is estimated at 3.5 GL, based on a broad assessment of infrastructure development and opportunity.

Annual diversion of 15 GL was only 16% of the Cap target of 94 GL. Water entitlement holders did not fully avail themselves of the access opportunities provided during the year for a number of reasons, including property development works and entitlements not fully developed.

Paroo

Resource availability

Rainfall recorded for 2009–10 at Hungerford in the southern part of the Paroo catchment was 463 mm. This was more than double the total recorded last year and well over the long-term average of 297 mm. The peak monthly rainfall was in February 2010 with 153 mm— against the long-term median for February of 18 mm.

The stream flow at Caiwarro, the last gauged location on the Paroo in Queensland, was 2,040 GL for 2009–10. This is well in excess of the average annual flow at Caiwarro of 553 GL (1968 to 2010) and significantly greater than the 140 GL recorded in 2008–09. The main flows ranged from 49 GL in November 2009 to 1,209 GL in March 2010.

There are no supplemented water allocations in this catchment. There are only two unsupplemented water allocations in the Paroo catchment. Diversion for irrigation was 0.07 GL.

Overland take from floodplain flows for the catchment is estimated at 1.5 GL, based on a broad assessment of infrastructure development and opportunity.

The annual diversion of 1.57 GL was 99% of the 2009–10 Cap target of 1.58 GL.

Nebine

Resource availability

Rainfall was well above average in the Nebine catchment with 520 mm recorded at Mulga Downs for the 2009–10 water year against an average of 397 mm. The peak monthly total of 184 mm was recorded in March 2010.

Mean annual flow from the Nebine catchment (including the Noorama and Widgeegoara creeks) is estimated at 33 GL per year. Flows either terminate on floodplains or discharge into the Culgoa River in New South Wales.

The new gauging station installed at Roseleigh Crossing (on Nebine Creek) now has three full years of recording. This gauging station is 10.5 km upstream of the Queensland–New South Wales border. A number of small flow events were recorded at Roseleigh Crossing station, during summer December to March period. A single large event occurred in March 2010 in Wallam Creek at Cardiff, upstream of Bollon.

Flows in Wallam Creek at Cardiff and Nebine Creek at Roseleigh for 2009–10 totalled around 145 GL and 110 GL respectively.

No supplemented water supply exists in this catchment. There are only four unsupplemented water allocations in the Nebine catchment. Diversion for irrigation was 0.9 GL. Overland flow take from floodplain flows for the catchment is estimated at 0.1 GL based on a broad assessment of infrastructure development and opportunity. Annual diversion of 1 GL (including overland flow take) was only 10% of the Cap target of 9.7 GL.

Moonie

Resource availability

Rainfall was average across the catchment during 2009–10. Rainfall in Nindigully, located on the Moonie River in the south-west, was 503 mm for the year, compared to the average of 516 mm. However, the peak monthly total of 202 mm recorded in March 2010 was the highest total for that month since recording began in 1916.

Streamflow for the Moonie River at Fenton, the most downstream gauge in Queensland, was 472 GL in 2009–10. This was more than three times the recorded annual average at this site of 142 GL.

There were a number of small flows from January to February 2010 with a subsequent large flow peaking at nearly 48 GL a day in March 2010. Record flooding at this time provided opportunity for floodplain harvesting.

No supplemented water supply exists in this catchment. Most of the 33 water allocations in this catchment have flow conditions that relate to the take from watercourses (water harvesting). Diversion for 2009–10 has been estimated at 28 GL, with take primarily occurring in January, February and March 2010.

Take is measured by metered works, however, metering of some of the larger works has been deferred until national standards are finalised. The Department of Environment and Resource Management is intending to complete metering on these works in late 2010. Meters will be installed in accordance with manufacturer's specifications if pattern approvals are not available. Water use assessments are currently completed for each of these works.

Overland take from floodplain flows for the catchment is estimated at 15 GL based on a broad assessment of infrastructure development and opportunity. Overland flow take is included in the Cap volume for the Moonie catchment.

The 2009–10 annual diversion for the Moonie catchment was 43 GL (including the floodplain component of overland flow), which was only 56% the Cap target of 76 GL.

Queensland Border Rivers catchment

Resource availability

Rainfall was generally below average across the Border Rivers catchment for the year. The upper catchment around Stanthorpe recorded 565 mm of rainfall compared to an average of 765 mm. The lower catchment around Goondiwindi recorded 423 mm of rainfall for the year compared to an average of 621 mm, with 158 mm of the annual total falling in March 2010.

On the Dumaresq River, the flow passing during the water year was 3.6 GL compared to an average annual flow of 74 GL. There were three flow events in the water year with the largest peaking at 0.3 GL/day.

Nearly 28 GL passed through Macintyre Brook compared to an average annual flow of 89 GL. There was one major flow event during March 2010 which peaked at 5.3 GL/day.

The flow passing during the water year on the Weir River was 182 GL compared to an average annual flow of 138 GL. There was one major flow event during March 2010 which peaked at 11.1 GL/day.

On the Macintyre River the flow was estimated at 193 GL compared to an average annual flow of 732 GL. There was one major flow event during March 2010 which peaked at 27.5 GL/day.

There are two major water supply storages in the Queensland part of the Border Rivers catchment. At 1 July 2009, Glenlyon Dam, the major storage for the Borders Rivers Water Supply Scheme (BRWSS), was at 24 per cent of capacity with around 15 GL available for general use from the Queensland share of the storage. The storage finished the year at 22 per cent of capacity with around 11 GL available for general use from the Queensland share.

Coolmunda Dam on Macintyre Brook is the major storage for the Macintyre Brook Water Supply Scheme. This scheme now operates on continuous accounting. Coolmunda Dam started the year at just under 40 per cent of capacity (27.6 GL) with 13.5 GL in storage accounts and, despite small inflows in March 2010, finished the year at 13 per cent of capacity.

In the 12 months to 30 June 2010, 21 GL of supplemented water was diverted within the Border Rivers Water Supply Scheme. This included supplemented take from releases from Glenlyon Dam, run of the river flows and 6 GL of bulk water supply provided from the Macintyre Brook Water Supply Scheme. The water take transferred from New South Wales (9 GL net) is also included in the total.

A total of 13 GL of supplemented water was diverted in the Macintyre Brook Water Supply Scheme.

Moderate flows in January and March 2010, triggered water harvesting access under the water sharing rules on the Border Rivers with 43.5 GL diverted over the two events. The March 2010 flows mostly originated from the Weir River and principally benefited the lower part of the Border Rivers catchment. Although in excess of 100 GL was made available to water users from the event, take was limited by available storage capacity to just over 20 GL. Water harvesting thresholds were also triggered in the Weir River with 35.7 GL diverted in this catchment.

A further 4.4 GL was diverted for water harvesting and direct irrigation purposes in the Granite Belt, taking the total unsupplemented diversions in the Border Rivers to 83.6 GL for 2009–10.

The majority of diversion in this catchment is metered. Essentially all take under water allocations is metered, and take under water licences (mostly area licences in the Granite Belt) is primarily unmetered.

An estimated 1.4 GL of overland flow water was taken during floodplain harvesting in the Border Rivers and Weir River catchments

Cap compliance

The IAG was advised that final Cap targets are unable to be calculated for the Border Rivers catchment at this time as the hydrologic model for the catchment is shared between Queensland and New South Wales and a collaborative effort to extend the model is unable to be scheduled until later in 2010.

However, the Cap target has been estimated at 156 GL based on the recorded streamflows at different locations along the river. The long-term record was interrogated to provide the diversion of a year matching the streamflow of the current year. Different years have been used for different parts of the catchment as this year the Weir River has had a relatively wet year while the remainder of the catchment has had below average annual total streamflow.

The estimated Cap target provided here will be updated with improved estimates when the Border Rivers model is updated with data provided by New South Wales.

The 2009–10 annual diversion for the Border Rivers Valley was 119 GL, which includes adjustments for trade and overland flow harvesting. This compares with 138 GL in 2008–09.

The preliminary estimated Cap target is 158 GL. Diversions of 119 GL are within the interim Cap target. On the basis of this preliminary data, the cumulative Cap credit since 2008 of 73 GL indicates that this valley is about 21% below the Cap.

Condamine and Balonne

Condamine

Resource availability

Rainfall was generally below average across the Condamine area. Annual rainfall across the area varied from 475–525 mm against an average of 670 mm. There were generally good falls in the western areas from December 2009 onwards, but the February–March 2010 event dominates the generally below-average rainfalls to the east.

The flow events in February and March 2010 passed along the entire Condamine system. A small event occurred in the lower catchment at this time, though this was generated primarily by tributary inflow. All events were sufficient to provide access to water harvesting.

A total of 634 GL passed Cotswold, at the end of the Condamine system, in 2009–10, compared to the long-term average of 609 GL. The flow past Chinchilla (located upstream) for the same period totalled 198 GL.

The major storage for the Upper Condamine Water Supply Scheme, Leslie Dam, started the year at 13% capacity and, with only minor inflow recorded, finished at 9%. No irrigation water was supplied from the storage during the year. The storage remains at critical levels with total capacity reserved for town water supply for the town of Warwick.

Chinchilla weir started the year at 70% capacity and filled in the March 2010 flow events. The weir finished the year at 78%. Announced allocation for the Chinchilla Weir Water Supply Scheme was 100% for high priority water allocations and 15% for medium priority water allocations at the start of the water year. The announced allocations for medium priority water were increased to 60% on 11 February 2010 and then to 100% on 3 March 2010 as the result of inflows into Chinchilla Weir.

A total of 20 GL of supplemented water was diverted in the Condamine catchment in 2009–10, with 17 GL diverted in the Upper Condamine scheme and 2.7 GL at Chinchilla. The volume diverted in the Upper Condamine was totally from run of the river flows, which are made available for diversion subject to minimum flow conditions.

Four flows triggered water harvesting access along the trunk stream and three periods of flow provided access in tributaries in the lower section of the Condamine. There were four water harvesting events announced between January and mid–March 2010 in the Upper Condamine Water Management Area.

The volume taken over 2009–10 is estimated at 62.8 GL with the majority of take occurring upstream of Chinchilla Weir. About 11 GL of this total was diverted for direct irrigation, with 3.8 GL taken from flows supplemented by treated effluent discharged from Toowoomba into the Gowrie–Oakey Creek system.

About 50 per cent by volume of water harvesting diversion in the Condamine catchment area is metered.

An estimated additional 2 GL of overland flow water was taken through floodplain harvesting on the Upper Condamine floodplain.

Balonne

Resource availability

Rainfall in the Balonne and Maranoa was above average and heavily influenced by the monsoonal systems in the summer months, through into March 2010. Rainfall across the area was typically 150 to 250 mm above the 500 to 550 mm average for the year with up to 300 mm occurring in February and March 2010.

Well above average rainfall recorded in February and March resulted in a moderate flow in February and record flows in March 2010 in the upper Balonne (comprising flow through from the Condamine plus tributary inflow). Flows were minimal for the remainder of the water year. The Maranoa had a similar pattern of flows and recorded a 588 GL passing flow for 2009–10 compared to an annual average of 127 GL.

Beardmore Dam started the year at 75 per cent. The dam had no inflow for the first six months of the 2009–10 water year, but filled and over-topped in February, March and April 2010, finishing the year at 85 per cent.

Inflows up to 730 ML/day may be passed downstream for environmental, stock and domestic purposes, or are sometimes held in storage for later release to maximise the benefit to downstream water users. A total of 66 GL of environmental, stock and domestic pass flow was released downstream over five events.

A total of 87 GL (including 0.02 GL from the Maranoa Water Supply Scheme) was diverted from the water supply schemes as supplemented water.

High flows in the Balonne in February and March 2010 resulted in the triggering of flow condition-based water allocations. Total estimated take in the Lower Balonne is 500 GL, taken over two announced periods. Flooding in the Lower Balonne in February and March 2010 allowed an additional take of 375 GL in floodplain harvesting.

An additional 2 GL of water was taken in the Maranoa catchment.

Cap compliance

The Condamine and Balonne resource operations plan was amended on 26 March 2010 to include the Lower Balonne part of the catchment. A Cap proposal was presented to the MDBA in October 2010 and will be assessed by the IAG. Subject to approvals, comparisons with Cap targets are likely to be possible for the 2010–11 year.

4.4.4 Administration of the Cap

Measures taken during the year

Queensland has received a formal request from the MDBA to review the Moonie, Warrego, Paroo and Nebine Cap models in order to properly treat overland flow take. Queensland will be discussing the matter further with MDBA, but at this stage is not considering any further review of the models pending the release of the Basin Plan.

A Cap proposal for the Queensland Border Rivers was noted by the Murray–Darling Basin Authority (Chief Executive acting as the Authority) on 26 March 2009, and further noted by the Murray–Darling Basin Ministerial Council at Meeting 1 on 29 May 2009. The Cap model has been submitted to the MDBA for review, by an independent auditor, and accreditation.

Cap targets are not available for the Queensland Border Rivers catchment for 2009–10 as extension of this model — a collaborative effort between New South Wales and Queensland — has been delayed until after November 2010. New South Wales has proposed to develop a protocol so that both states are fully aware of the requirements and commitments of the other state. This will ensure that both states can provide up-to-date advice within the timeframe required.

Measures proposed during 2010–11

A Cap proposal for the Condamine and Balonne has been prepared and was submitted to the MDBA in October 2010. The Cap proposal will be assessed by the IAG and recommendations provided to the Ministerial Council.

The Condamine and Balonne model will be finalised and submitted for accreditation in 2010–11.

Council meeting 42–25 May 2007, approved the Caps proposed for the Warrego, Moonie, Paroo and Nebine Cap valleys, and compliance on these is being reported. The Cap models for the Warrego, Moonie, Paroo and Nebine have been audited by an independent reviewer and approved by the MDBA in April 2010.

The Cap model for the Warrego, Paroo, Moonie and Nebine has been audited by the independent auditor and approved by the MDBA in April 2010.

Queensland will progress a number of resource operation plan amendments in 2010–11 including:

- Border Rivers — to be released for public comment in mid–October 2010. Changes include multi-year accounting and temporary trading rules. There will be no impact on the Cap.
- Condamine–Balonne — to be released in mid-November 2010 for public comment. Proposed provision for critical water supply and beneficial use of coal seam gas water. The latter could lead to Cap adjustments.

Queensland also proposes to amend the Condamine–Balonne water resource plan to incorporate the Central Condamine alluvial groundwater area. This proposal will reduce estimated use to 40 GL/year by 2014, with the ability to carryover from year-to-year. The proposal will be released for public comment in early November 2010.

Queensland Border Rivers

A Cap proposal for the Queensland Border Rivers was noted by MDBA (Chief Executive acting as the Authority) on 26 March 2009 and further noted by the Murray–Darling Basin Ministerial Council at Meeting 1 on 29 May 2009.

Cap targets are unable to be calculated for the Border Rivers Valley at this time as the hydrologic model for the catchment is shared between Queensland and New South Wales and a collaborative effort to extend the model is unable to be scheduled until later in 2010.

However, an estimation of the Cap target has been derived from the recorded streamflows at different locations along the river. The long-term record was interrogated to provide the diversion of a year of the same magnitude of recorded streamflow. Different years have been used for different parts of the catchment as this year the Weir River has had a relatively wet year while the remainder of the catchment has had below average annual total streamflow.

The estimated Cap target provided here will be updated with improved estimates when the Border Rivers model is updated.

A Cap proposal for the Condamine and Balonne has been prepared and submitted to the MDBA in October 2010.

The Cap model will be submitted for review by the independent auditor and accreditation in 2010–11.

4.4.5 Monitoring and reporting

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.

4.4.6 IAG assessment

Following above average rain in the western Queensland Basin valleys, total diversions, including overland flow harvesting, were 1,229 GL compared to 383 GL in 2008–09. This was the highest level of diversions recorded. Overland flow diversions are estimated to be 398 GL of this total.

Cap targets are available for the Warrego, Paroo, Nebine and Moonie and diversions in 2009–10 were well within Cap targets. Some overland water harvesting has not been fully accounted in modelling undertaken to date. The regulation of overland flow works in the water resource plan for these valleys effectively caps diversion of water to levels within the agreed Cap.

The IAG is only able to form a preliminary view as to Cap compliance for the Border Rivers. The IAG received advice that Cap targets are unable to be calculated for the Border Rivers at the time of the audit (September 2010) as the hydrologic model for the valley is shared between Queensland and New South Wales and a collaborative effort to determine a Cap target is unable to be scheduled until later (November) in 2010.

In the view of the IAG, this is unacceptable as it avoids the primary purpose of the audit process which is to ascertain compliance (or otherwise) with the Cap targets. The IAG was provided with an estimate of the Cap targets as an interim measure. The IAG recommends that a separate 'desktop' supplementary audit be conducted when the relevant modelling has been completed.

The IAG also supports the proposal put forward by New South Wales and supported by Queensland 'to develop a protocol so that both states are fully aware of the requirements and commitments of the other state'.

The Condamine and Balonne resource operations plan was amended on 26 March 2010 to include the Lower Balonne part of the catchment. A Cap proposal was submitted to the MDBA in October 2010. It will then be assessed by the IAG and advice provided to the Authority. Reporting against Cap targets will be possible, commencing in 2010–11, which will complete the process of establishing Caps for Queensland valleys which started in 1996.

The IAG notes that the models that have been developed for the Queensland system have relied upon a range of information. In part this has included 'irrigator estimates' of some diversions that have occurred off the floodplains. These are pre-existing works that are authorised under the moratorium on new works that has been applied. Not all of these diversions have been fully accounted at this stage.

It is intended that the process of metering and adopting new technology to capture harvested quantities will gradually result in improved data for these diversions. This is not considered to be a major issue, but will have some implications for the models and the operating plans as more reliable information becomes available. For the larger floodplain diverters, there are estimates included in the models based on best available information, and these estimates continue to be checked and assessed.

Metering continues to be implemented for surface water diversions from streams and rivers. Metering is now in place for all major extractions for the Border Rivers and programs are in place through a state-wide project to finalise metering of areas which have not yet been metered in the remaining catchments by the end of 2011.

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 off-take of water in accordance with those licences.

The IAG compliments Queensland on its detailed submission on water use, management and Cap compliance.

4.4.7 Conclusions and recommendations

- Total diversions in 2009–10 were 1,229 GL compared to 383 GL in 2008–09.
- The total includes 831 GL of stream diversions and an estimated 398 GL of overland flow harvesting.
- Above average rainfall in the western valleys resulted in flooding and end-of-system flows of 6,242 GL compared to 391 GL in 2008–09.
- The Cap is set for all Queensland valleys except for the Condamine–Balonne. However, Cap targets for 2009–10 were only available for the Warrego, Paroo, Nebine and Moonie, which were all below the relevant Cap targets.
- A final Cap target is unable to be calculated for the Border Rivers valley (as of September 2010) as the hydrologic model for the catchment is shared between Queensland and New South Wales and a collaborative effort to extend the model is unable to be scheduled until later in 2010.
- As a consequence, the IAG formed a preliminary view as to the compliance, or otherwise, with Cap targets for the Border Rivers. The diversion of 119 GL was below the estimated Cap target of 158 GL.
- The IAG recommends that for the Border Rivers:
  - a supplementary (desktop) audit be done when the collaborative modelling is completed 'later in 2010', and
  - a protocol be developed so that both New South Wales and Queensland are 'fully aware of the requirements and commitments of the other State'.
- A presentation for a Cap proposal for the Condamine–Balonne was made to the IAG and has been submitted to MDBA.
- A metering program is being progressively rolled out as part of a Queensland state-wide project to meter all entitlements. The project will ensure reliable information on water use is available as the resource operation plans are implemented.

4.5 Australian Capital Territory

4.5.1 The Cap

At Meeting 45 on 23 May 2008, the Ministerial Council:

- defined the Cap for the Australian Capital Territory as: **Until the Basin Plan under the *Water Act 2007* (Commonwealth) comes into effect, the Australian Capital Territory Cap is:**

  (i) 40 GL (42 GL minus 2 GL saving allocated to The Living Murray) climate-adjusted as recommended by the IAG, plus

  (ii) Australian Capital Territory Cap is reviewed and increased by 0.75 of the current per capita consumption of water for population growth of Canberra and Queanbeyan.

With conditions that:

- no urban water will be traded out, other than that purchased from interstate
- any growth in demand for water for industry and future Commonwealth use will be provided by trade, and
- existing Cap credits (based on the assumption that 40 GL Cap applied since 1 July 1997) are recognised
- noted the Commonwealth and the Australian Capital Territory need to settle the management arrangement for the water controlled and used by the Commonwealth and its agencies.
- noted the concerns raised by South Australia regarding the effect of the growth factor on the South Australia Cap.

Following this, Schedule E to the Murray–Darling Basin Agreement (Schedule 1 of the *Water Act 2007*), has defined the long-term diversion Cap for the Australian Capital Territory as:

(1) The Government of the Australian Capital Territory must ensure that diversions from the designated river valley in the Australian Capital Territory do not exceed 40 GL per annum (being 42 GL minus 2 GL saving allocated to the Living Murray), varied as required by sub-clause (2).

(2) The long-term diversion Cap referred to in sub–clause (1) is to be annually adjusted:

(a) for the prevailing climate during the water year by reference to the model developed under sub-clause 11(4), and

(b) to account for growth in population, in accordance with the following formula:

0.75 multiplied by:

2006–07 per capita consumption of the population of Canberra and Queanbeyan, multiplied by:

the difference between the population of Canberra and Queanbeyan in 2006–07 and the population of Canberra and Queanbeyan for each year in consideration.

(3) The Australian Capital Territory Government must ensure that no water or water entitlement used for urban purposes will be transferred for use outside the Australian Capital Territory unless that water or water entitlement has been transferred for use within the Australian Capital Territory from another state.

(4) If demand for water for industrial uses or uses by the Commonwealth grows beyond the level of demand in 2006–07, that growth in demand will be met by transferring water or water entitlements from another state.

(5) The Authority must, for the purposes of maintaining the Cap register referred to in sub-clauses 13(7) and 13(8), take into account 107 GL of cumulative Cap credit existing at the end of 2006–07.

While there are still issues of interpretation, as required, the IAG has audited against Schedule E.

The Australian Capital Territory has reported on its diversion of water against the long-term diversion Cap.

Gross diversions and returns are provided in **Table 19**.

During 2008–09 the Australian Capital Territory developed a Cap model to implement the Australian Capital Territory Cap determined by the Ministerial Council. The Australian Capital Territory proposes to use the potable demand modelling of Australian Capital Territory and Queanbeyan water use as developed by ACTEW Corporation. The model is climate-adjusted and also separately accounts for the

Table 19: Diversions for consumptive use within the Australian Capital Territory and Queanbeyan (GL)

System	Long-term diversion Cap	ACTEW diversion	Direct diversion	LMWQCC return	QSTP return	Net diversion	Net trade
ACT	40	45.2	4.5	26.8	2.4	20.5	nil

LMWQCC - Lower Molonglo Water Quality Control Centre
QSTP - Queanbeyan sewage treatment plant

variables of water restrictions and population growth. In 2010, the model is being reviewed to include a correction factor and will be submitted to MDBA for auditing and final accreditation.

Diversions reported in **Table 19** relate only to those made under licences issued by the Australian Capital Territory Government. Data for diversions controlled by the Commonwealth (chiefly from Lake Burley Griffin and estimated at less than 1 GL/year), and not licensed by the Australian Capital Territory Government, are not included in the diversions table.

The Territory Government and the Commonwealth have discussed the transfer of water planning and management of Lake Burley Griffin (responsibility of the National Capital Authority) to Australian Capital Territory water resources management. To expedite this transfer, the Commonwealth has prepared amendments to the legislation but due to the recent federal election and other competing commitments, the Australian Parliament is yet to pass the legislation. The Australian Capital Territory also enacted related legislative amendments to enable it to manage Commonwealth water resources. This was enacted by the Assembly in August 2010 through the *Water Resources Amendment Act 2010*. At this stage the Australian Capital Territory does not have the legal capacity to account for and manage the Commonwealth water resources within its borders.

The Australian Capital Territory has recently received modelling from ACTEW Corporation which incorporates a population correction factor. It is expected that the model will be formally submitted to MDBA in October.

Non-urban surface and groundwater uses are yet to be incorporated into the Cap. The Australian Capital Territory believes that even though these volumes are known with a fair degree of certainty, an estimated 4.5 GL/year, the volumes are outside the Cap. This matter is not yet resolved.

The inclusion of diversions controlled by the Commonwealth into the Cap is also an issue on which there is some disagreement between the Australian Capital Territory and MDBA officials. Although the volumes are not large, this matter needs to be resolved to clarify future Cap reporting and auditing.

The Australian Capital Territory is developing a revised Cap model which contains a method for reducing the annual Cap targets based on the historical restrictions.

Data for diversions managed by the Commonwealth (chiefly from Lake Burley Griffin) and not licensed by the ACT Government are not yet available. The diversions reported in **Table 19** relate only to those made under licences issued by the Australian Capital Territory Government. However, it is estimated by the Australian Capital Territory that the diversions made under arrangements managed by the Commonwealth amount to less than 1 GL/year.

4.5.2 Administration of the Cap

As in recent years, demand management continued to have an increasing impact on both internal and external urban use during 2009–10. Internal water use continues to fall steadily from a high of 46 GL (net) in 1990–91, despite the growth in population, and was the third lowest recorded in 17 years at 20.6 GL. Stage 3 water restrictions again remained in force throughout 2009–10.

In May 2008, the Australian Capital Territory referred a proposal to enlarge the Cotter Dam to the former Murray–Darling Basin Commission under clause 46 of the Murray–Darling Basin Agreement. The enlargement of the dam is not expected to have a significant effect on the availability of flows in the remainder of the Murray–Darling River system. A report sent to the Commission in November 2008 on the impact of the enlarged Cotter Dam was subsequently considered at its Natural Resources Management Committee.

There was no new industrial use or new Commonwealth water requirements in 2009–10, and hence no calls for additional water under the Australian Capital Territory Cap provisions.

There was no external water trading by the Australian Capital Territory and very few internal water trades.

The Tantangara transfer project involves transferring water from the regulated Murrumbidgee River to the Australian Capital Territory via the Snowy Mountains Scheme. The transfer will help combat the drastic effects of climate change on the Australian Capital Territory's water supply by providing access to a source of water not dependent upon the local rainfall. ACTEW has completed the purchase of its water portfolio for the project, which included 4.15 GL of high security water entitlements and 12.52 GL of general security options. Cap adjustments will be made as water comes into the Australian Capital Territory.

4.5.3 Monitoring and reporting

The Australian Capital Territory has established a system of volumetric licences for all users of water in the territory. The Australian Capital Territory is able to report its consumptive usage against information provided by licence holders. As ACTEW Corporation (the water service provider in the Australian Capital Territory) will be the main licensed user of water from the system, the level of accuracy from this monitoring process will be high. The issuing of licences to groundwater and other surface water users, the licensing of catchment infrastructure on small catchments (such as farm dams), and the reporting of water controlled and consumed by the Commonwealth fills any possible gap in the collection of water use data in the Australian Capital Territory.

ACTEW modelling and analysis reveal that for 2009–10 from Stage 3 temporary water restrictions, compared to the estimated demand from the climate-adjusted model, 27.5 GL of water was saved in Canberra.

Stream inflows in the Australian Capital Territory region were low but improved during the last quarter of the year.

Dam storage levels were just above 40% at the start of the water year but, as a result of good autumn and early winter rain, storage levels were over 50% by 30 June 2010. The maintenance and acceptance of water restrictions during the drier months enabled the Australian Capital Territory to deal with drought conditions and maintain adequate storage levels.

4.5.4 IAG assessment

Net diversions of 20.5 GL in the Australian Capital Territory during 2009–10 were the third lowest for the past 17 years. These results do not include Commonwealth diversions which, in gross terms, are possibly no more than 1 GL.

The Australian Capital Territory is awaiting Commonwealth legislation to enable Commonwealth diversions to be managed by the Australian Capital Territory and captured by its reporting process.

A climate-adjusted model has been developed. This model incorporates a population correction factor. It is expected that this model will be submitted to MDBA for auditing and formal accreditation during October 2010. The IAG welcomes progress on this matter.

The IAG notes that it has previously recommended to Council that the Australian Capital Territory model also include the proviso for surface and groundwater usage. While the Australian Capital Territory believes that these volumes can be measured with a fair degree of certainty, it holds the view that these flows are outside the Cap.

4.5.5 Conclusions and recommendations

- Net diversions of 20.5 GL were well below the long-term diversion Cap target of 40 GL.
- Progress has been made towards including the Commonwealth diversions in Australian Capital Territory reports. The IAG understands that this matter will be finalised, and the reporting requirements met during 2009–10.
- The IAG welcomes progress on the development of a model for calculating a climate-adjusted Cap and its submission for auditing and accreditation in October 2010.
- The IAG notes that this climate-adjusted model, which will be used to administer the Cap, will also incorporate adjustments for population growth.
- The Australian Capital Territory and the Authority need to resolve the outstanding interpretive differences between the Ministerial Council decision of 23 May 2008 and Schedule E to the Murray–Darling Basin Agreement (Schedule 1 of the *Water Act 2007*). Should the matter not be resolved, the IAG recommends that a submission be made to the Ministerial Council.

5. Diversions from the Murray–Darling Basin in 2009–10

5.1 Summary of diversions 2009–10

Murray–Darling Basin diversions in 2009–10 totalled 5,472 GL — the fourth lowest annual diversion since 1983–84 and only 56% of the average diversion over the same period. Diversions for the individual valleys in the Murray–Darling Basin are presented in **Table 20.**

Table 20: Murray-Darling Basin diversions in 2009–10

System	Total diversion	Percentage of Basin diversion
New South Wales		
Intersecting Streams	3	0.1%
Border Rivers	115	2.1%
Gwydir	57	1.0%
Namoi/Peel	172	3.1%
Macquarie/Castlereagh/Bogan	109	2.0%
Barwon-Darling/Lower Darling	156	2.8%
Lachlan	26	0.5%
Murrumbidgee	855	15.6%
Murray	439	8.0%
Total NSW	**1,932**	**35.3%**
Victoria		
Goulburn/Broken/Loddon Cap Valley	804	14.7%
Campaspe	26	0.5%
Wimmera-Mallee	10	0.2%
Murray/Kiewa/Ovens Cap Valley	971	17.7%
Total Victoria	**1,810**	**33.1%**
South Australia		
Metro-Adelaide & Associated Country Areas	57	1.0%
Lower Murray Swamps	14	0.3%
Country Towns	38	0.7%
All Other Uses of Water from the River Murray	372	6.8%
Total South Australia	**480**	**8.8%**
Queensland		
Condamine/Balonne	1049	19.2%
Border Rivers/Macintyre Brook	119	2.2%
Moonie	43	0.8%
Nebine	1	0.0%
Warrego	15	0.3%
Paroo	2	0.0%
Total Queensland	**1,229**	**22.5%**
Australian Capital Territory	**21**	**0.4%**
Total Basin	**5,472**	**100.0%**

The diversions over the last eight years all rank in the lowest 10 years of usage in the 27 years since 1983–84. Since 1983–84, total Basin diversions in 2009–10 ranked 24; diversions in New South Wales, Victorian and South Australia ranked 25, Queensland one and the Australian Capital Territory 23. Of the total water diverted, New South Wales diverted 35%, Victoria 33%, Queensland 23%, South Australia 9% and the Australian Capital Territory 0.4%. Annual diversions since 1983 are plotted in **Figure 1 and Figure 2**.

Figure 1: Murray–Darling Basin diversions 1983–84 to 2009–10

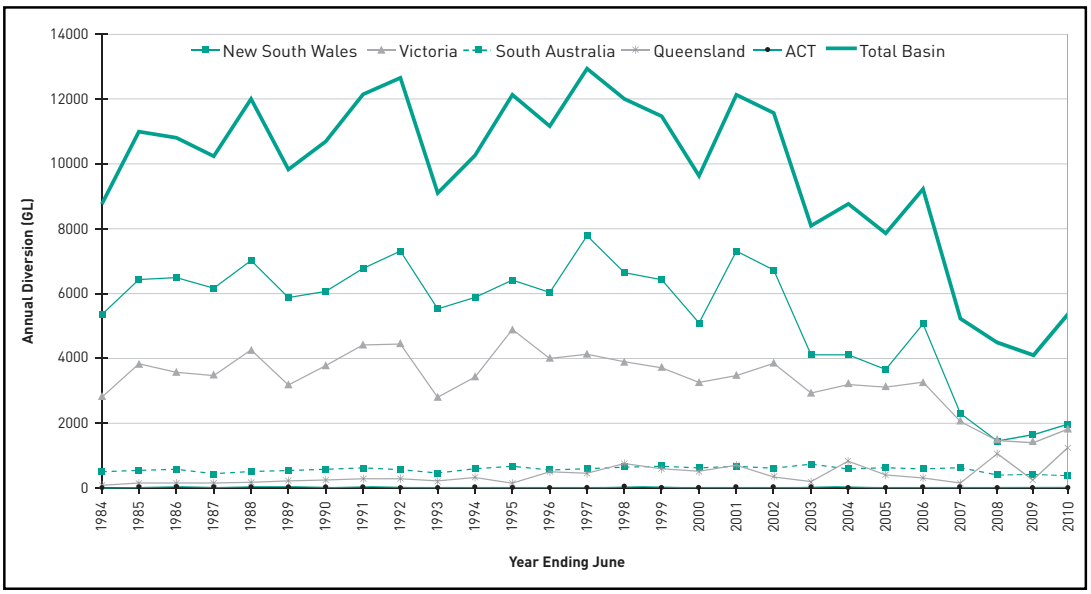
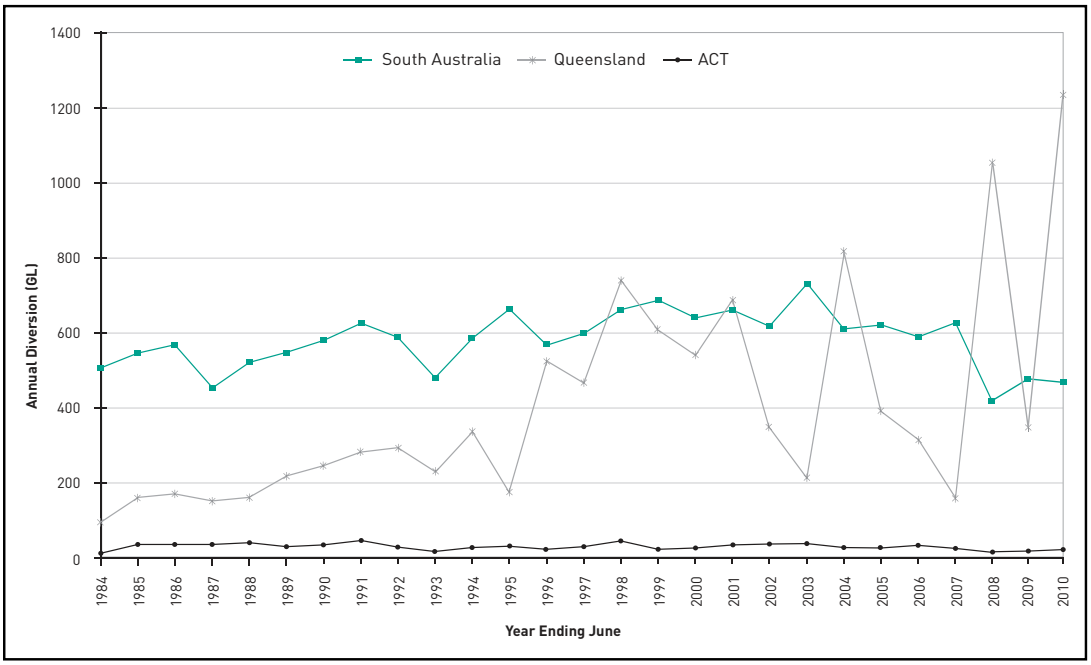


Figure 2 : Murray–Darling Basin diversions 1983–84 to 2009–10 (Queensland, South Australia and Australian Capital Territory)



Historical Cap and diversions

The IAG is of the view that full transparency of all relevant and available data is consistent with both good governance, in terms of operating the Cap, and good Cap management practice. Accordingly, the IAG has decided that when amendments to models (or data) have been necessary or untaken for reasons outlined earlier in this report, then historical records should be adjusted and the revised Cap and performance against the Cap should be reported. Effectively this has occurred to some extent in previous reports of the IAG. However, from the 2007–08 report, the IAG has determined that it will publish historical series of all valley models and performance against the modelled Caps where the information is available.

It is not the IAG's intention that the performance of any one state or valley should be judged on historical performance, other than the most recent year. Rather, it is the intention to provide information which will help inform the Ministerial Council and other readers of past performance, which may assist in interpreting individual valley performance in the latest year.

The following graphs provide details of the climate-adjusted Cap and diversion data, together with debits or credits held on a valley-by-valley basis. The IAG envisages that these graphs will be reproduced in its report each year and updated where more up-to-date data has been provided, or modelling adjustments have resulted in a change in the Cap and debit/credit outcomes.

Figure 3 : Cap compliance — South Australian Country Towns

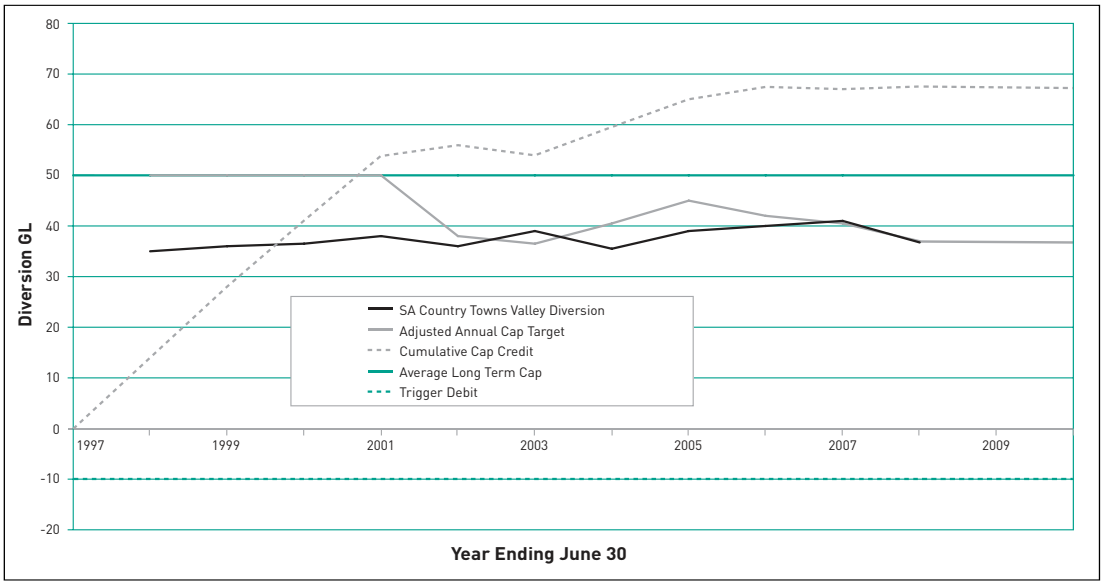


Figure 4 : Cap compliance — South Australian All Other Purposes and Lower Murray Swamp

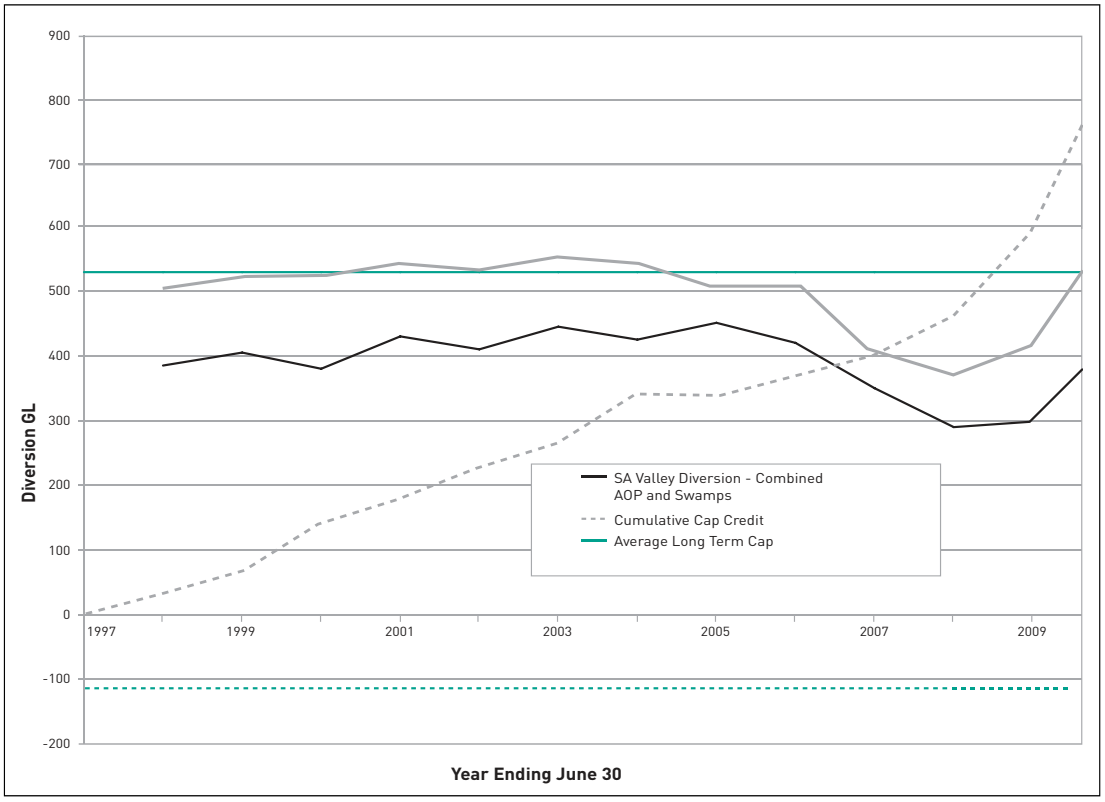


Figure 5 : Cap compliance — Victorian Goulburn/Broken/Loddon

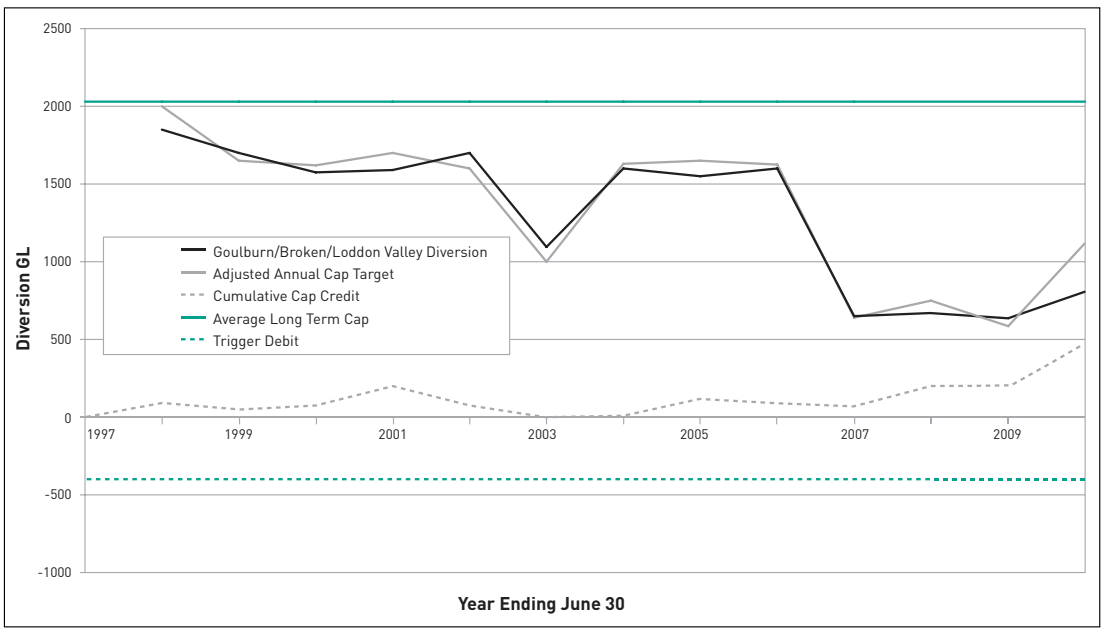


Figure 6 : Cap compliance — Victorian Murray/Kiewa/Ovens

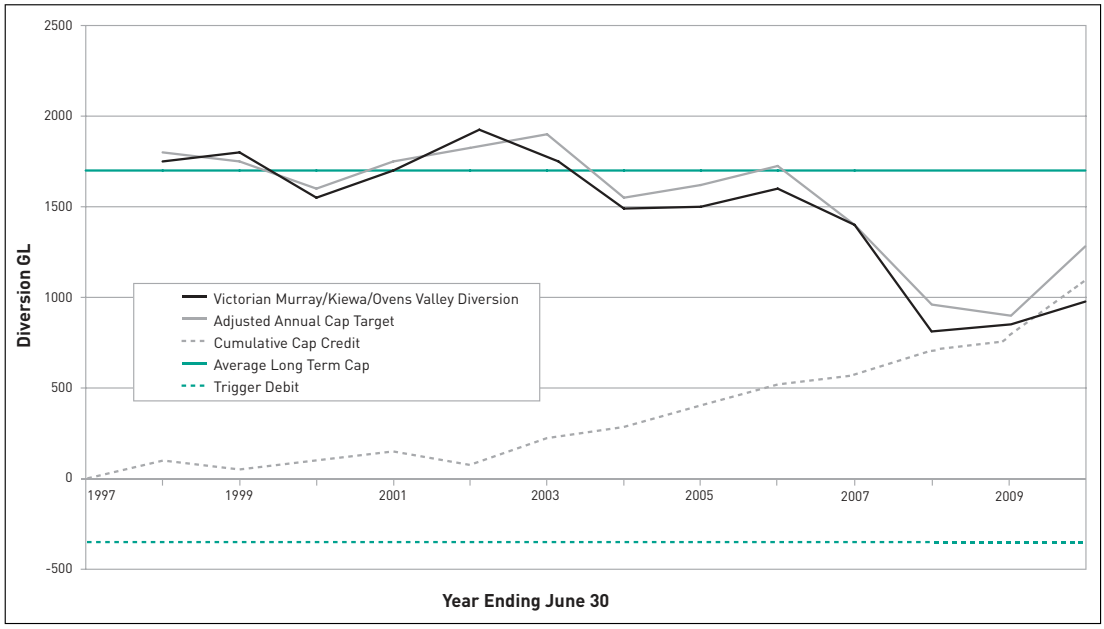


Figure 7 : Cap compliance — Victorian Campaspe

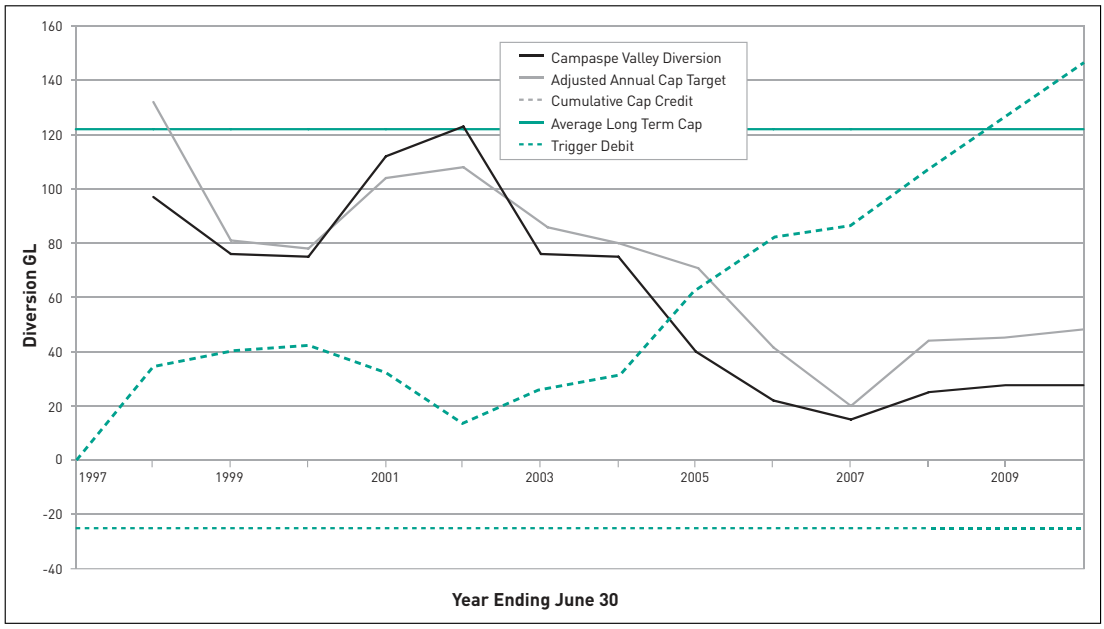


Figure 8 : Cap compliance — Victorian Wimmera–Mallee

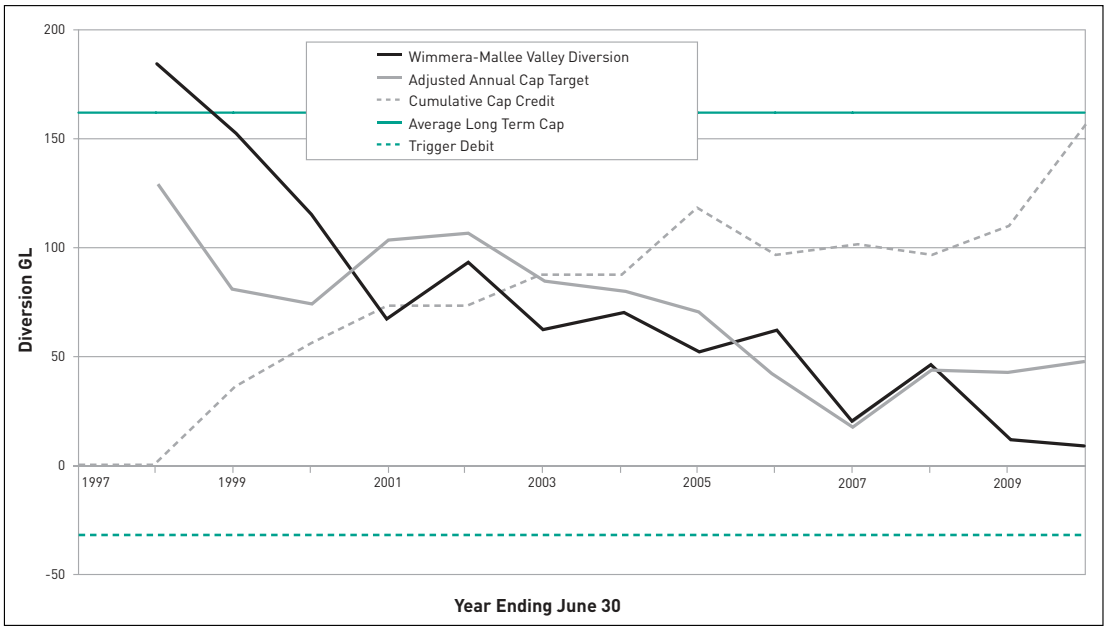


Figure 9 : Cap compliance — New South Wales Barwon–Darling

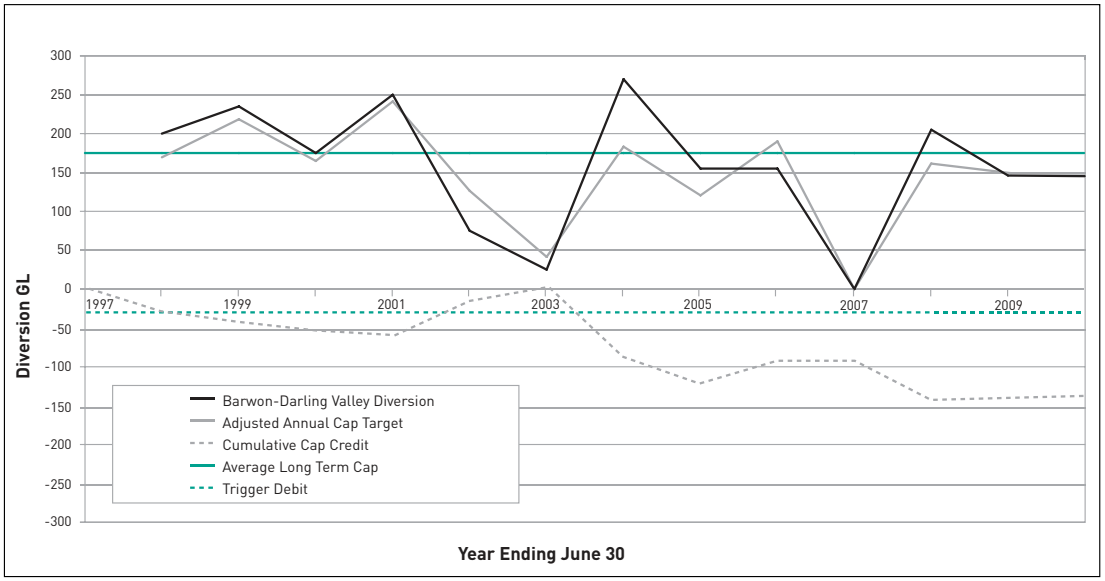


Figure 10 : Cap compliance — New South Wales Lower Darling

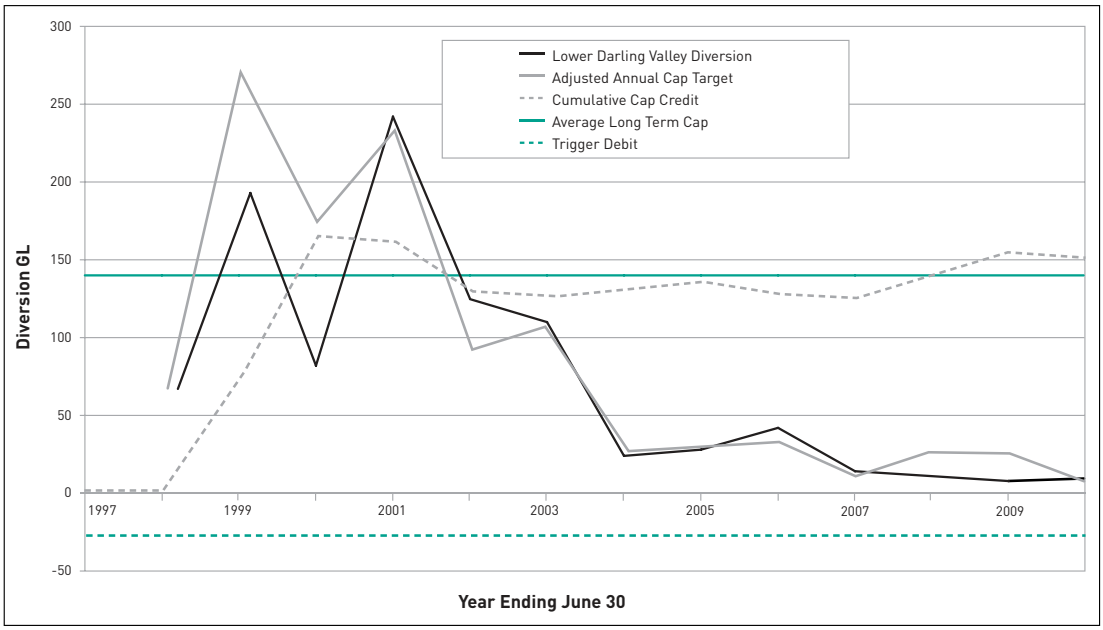


Figure 11 : Cap compliance — New South Wales Barwon–Darling/Lower Darling

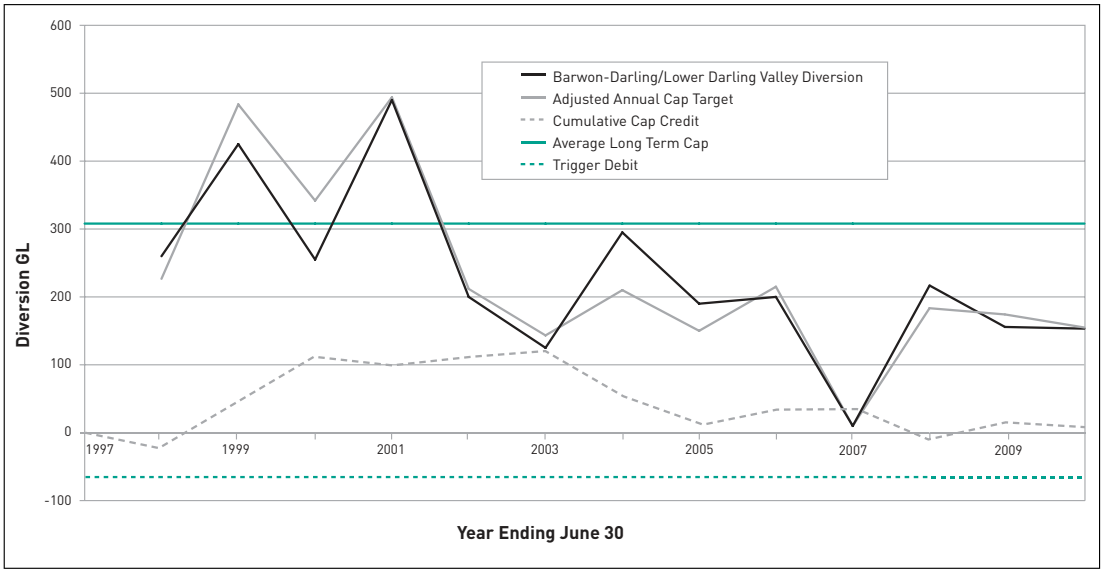


Figure 12 : Cap compliance — New South Wales Gwydir

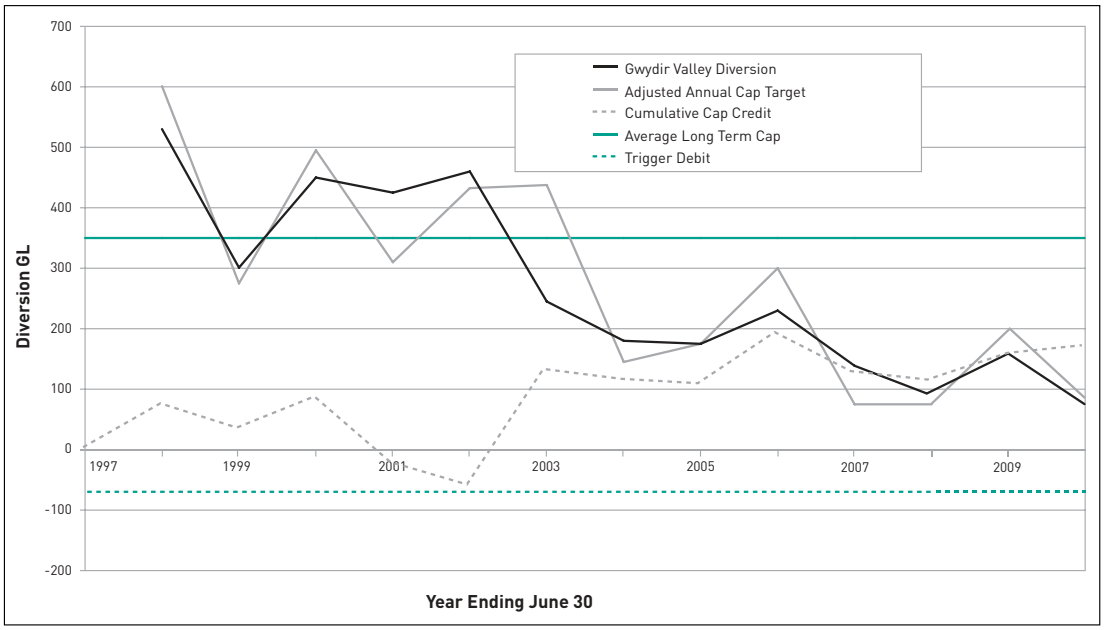


Figure 13 : Cap compliance — New South Wales Namoi/Peel

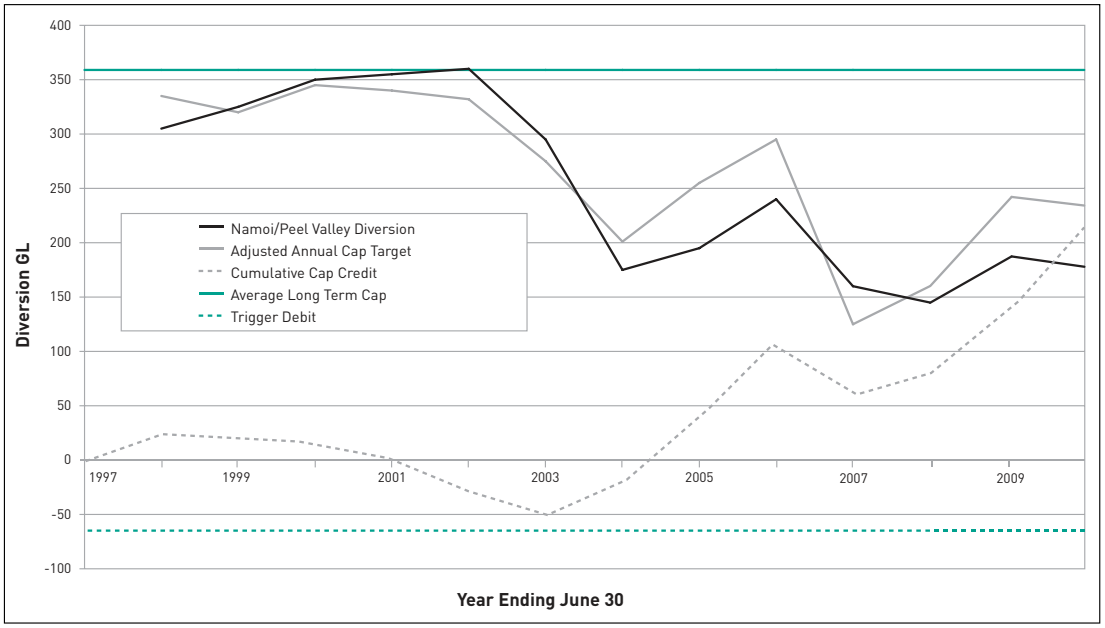


Figure 14 : Cap compliance — New South Wales Macquarie/Castlereagh/Bogan

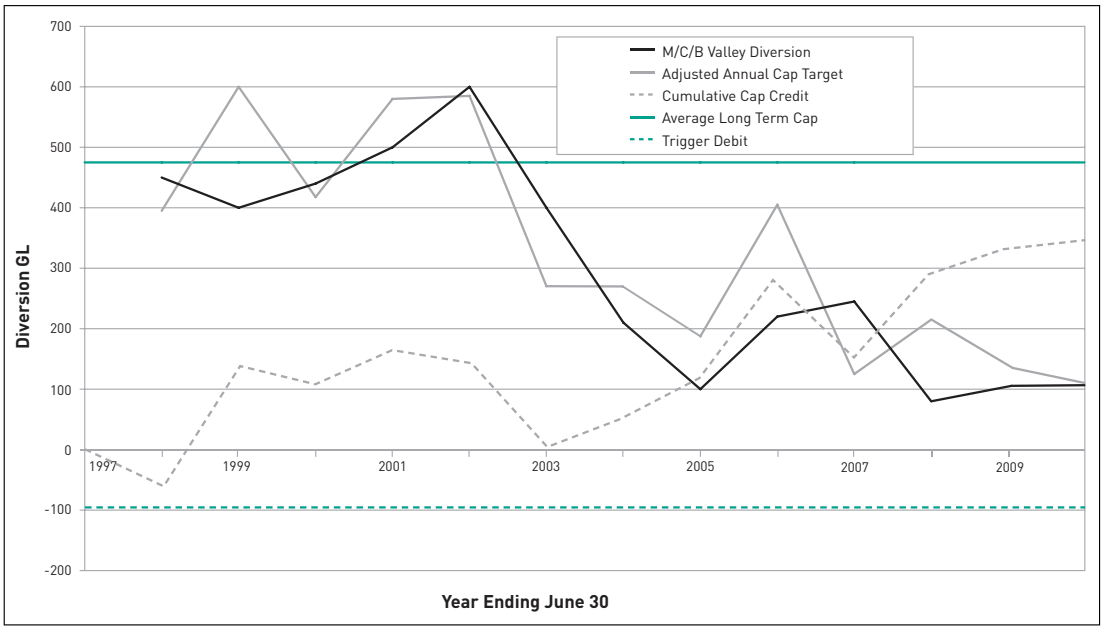


Figure 15 : Cap compliance — New South Wales Lachlan

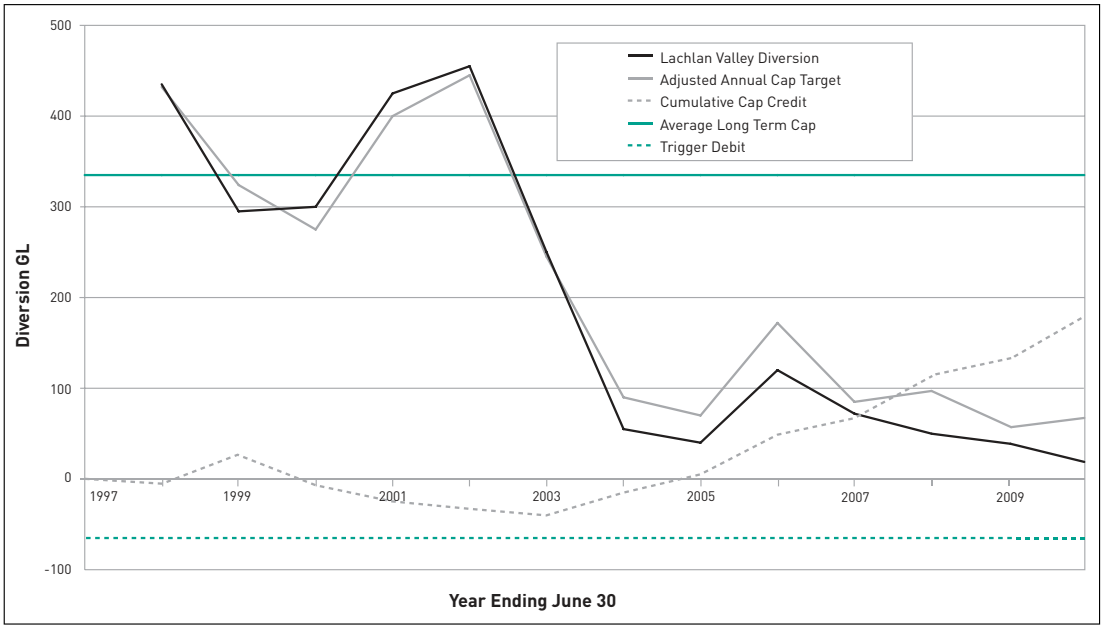


Figure 16 : Cap compliance — New South Wales Murrumbidgee

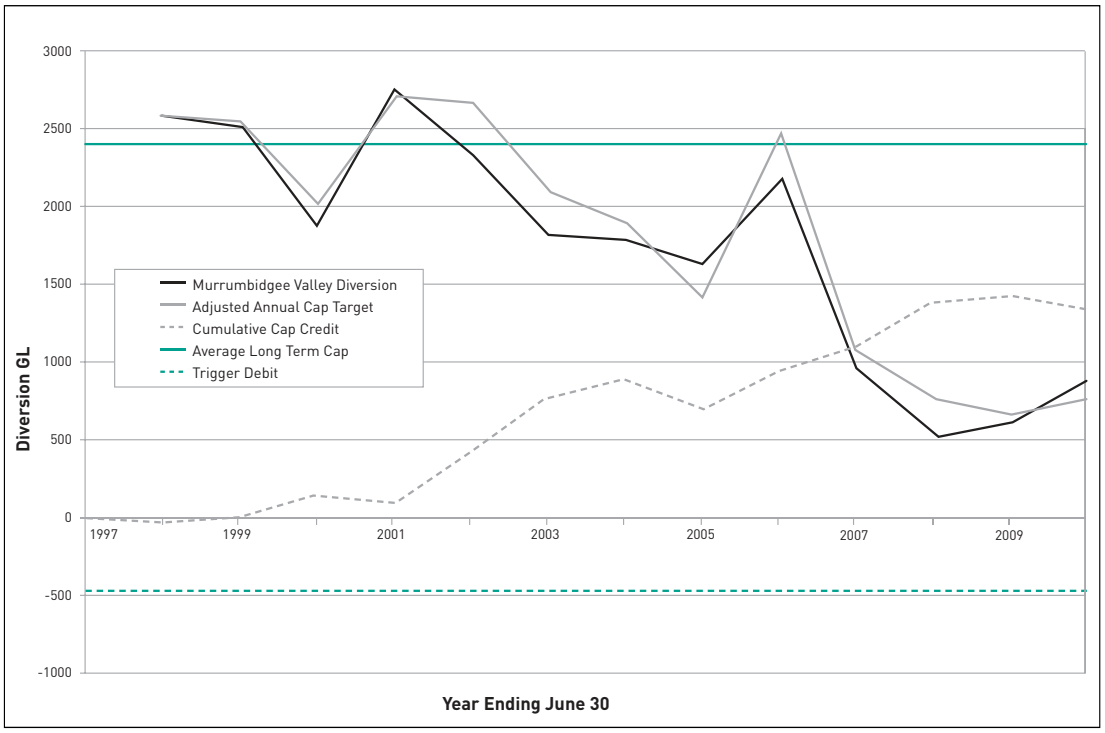


Figure 17 : Cap compliance — New South Wales Murray

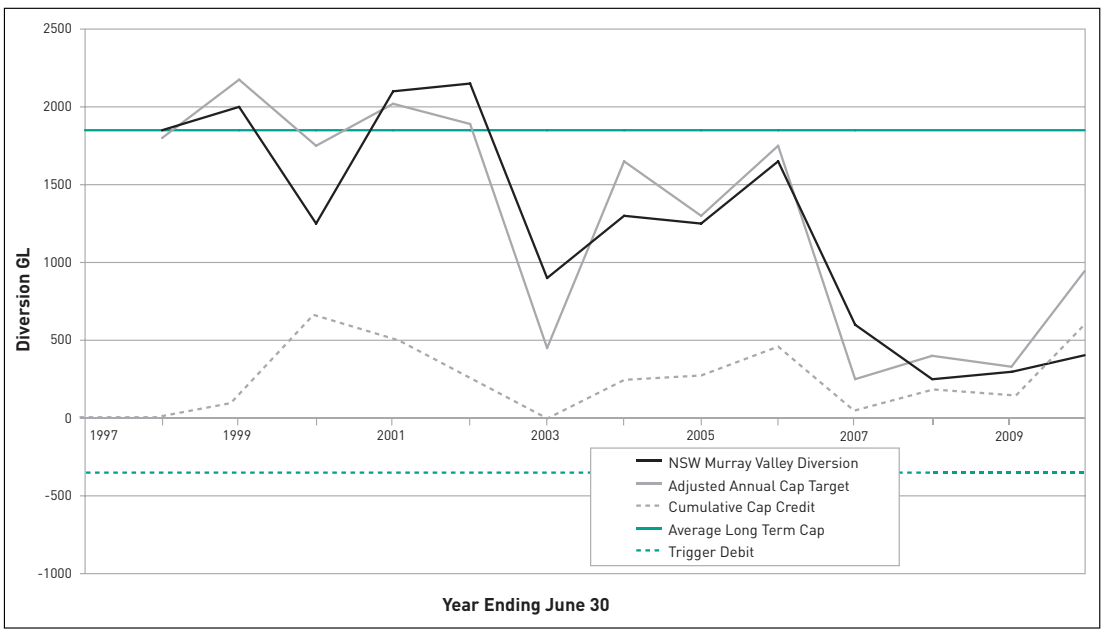


Figure 18 : Cap compliance — Queensland Border Rivers

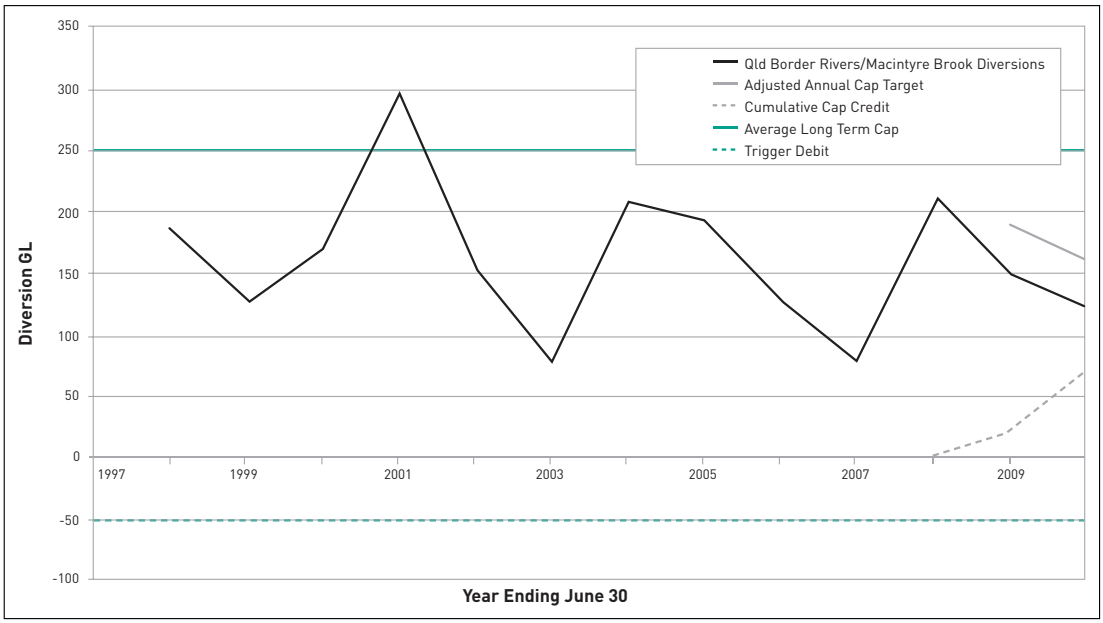
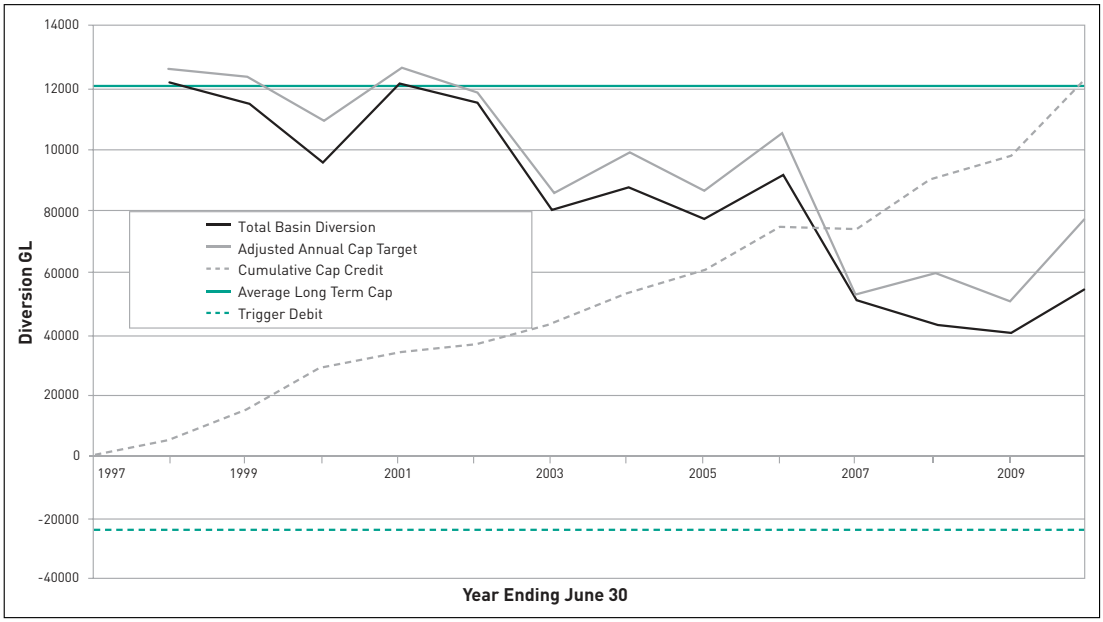


Figure 19 : Cap compliance — Murray–Darling Basin
(Valleys without a defined Cap are assumed to be at Cap diversion levels)



Appendix A: Responses by the five state and territory governments

The five Basin 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 December 2010. The Council agreed to publish these responses as an appendix to the Independent Audit Group's report.

SOUTH AUSTRALIA

The IAG noted that diversions were constrained as a result of low water allocations in 2009–10. South Australia continues to implement previous commitments to the IAG, including implementing a restriction method in its Cap accounting systems, merger of the Lower Murray Swamps and All Other Purposes Caps and adjusting annual Cap calculations for the use of environmental water.

South Australia continues to work on measures to refine implementation of the Cap.

A submission is currently being prepared for the MDBA and IAG in relation to the merger, inclusion of restrictions and adjustments for environmental water use and trade. This submission will be provided to the MDBA in early 2011 and the process was discussed at the meeting in September 2010 and supported in principle by the IAG. The amalgamation will require an amendment to Schedule E and a submission will be provided to the Ministerial Council in 2011.

The process of including restrictions also applies to the Country Towns Cap and the necessary amendments have been made to the annual calculation of Cap credits.

The IAG has previously recommended South Australia develop a new climate-adjusted annual Cap model for Metropolitan Adelaide and Associated Country Areas to take account of demand, local Mount Lofty inflows, system operating rules and to include an allowance for water restrictions.

Work is progressing on the new climate-adjusted Cap model and its development has been consistent with other Cap models across the Murray–Darling Basin. The complexity and variability of inflows into the Mount Lofty Ranges storages has required additional investigations to ensure that a robust method for determining extraction limits and the correct information is used to determine annual inflows under the 2000 levels of development conditions.

South Australia notes that all other interstate Cap valleys remained within their annual Cap targets, although cumulative Cap credits were used in some valleys.

The desktop supplementary audit of the Border Rivers Cap compliance is supported. Details of the audit should be included in the 2009–10 Water Audit Monitoring Report, which is due in December 2010.

South Australia supports the development and updating of Cap models to take into account changed conditions, system operating rules, restructuring of entitlements.

VICTORIA

Victoria continued to manage the Cap on regulated systems using bulk entitlements in accordance with the Victorian *Water Act 1989* and streamflow management plans on unregulated streams. No new capping measures were introduced in 2009–10 as diversions in all Victorian valleys are well within Cap limits.

Annual Cap targets are estimated using hydrological models in accordance with the requirements of Schedule E to the Murray–Darling Basin Agreement. Accredited Cap models or updated versions of these models for Goulburn/Broken/Loddon, Campaspe and Murray/Kiewa/Ovens valleys were used to calculate the 2009–10 Cap targets and cumulative Cap credits for these valleys. An interim model, which was submitted to the MDBA for accreditation in December 2009, has been used to calculate Cap targets and cumulative Cap credit for the Wimmera–Mallee valley.

During 2009–10, diversions from each of Victoria's four designated valleys were below their Cap targets. Carryover of unused allocation was the main contributor to the significant Cap credits in 2009–10. All the Victorian valleys have accumulated Cap credits up to 30 June 2010.

Victoria proposes to continuously improve the performance of its hydrological models where practicable. The Murray model has been updated by the MDBA and all updated models will be reviewed by the Water Audit (Cap) Advisory Panel before being considered for approval by the MDBA.

The IAG has noted Victoria's proposal for creating a new 40 GL environmental entitlement to unregulated flows in the River Murray, to formally recognise the historical use of unregulated flows in Victoria. It has suggested that this would be subject to MDBA approval.

Victoria remains committed to the provision of water for the environment and the reduction of the Cap when environmental flows are increased. The method proposed by Victoria for reducing the Cap to exclude environmental entitlements was approved by MDBA on 30 October 2010.

The data submitted to the IAG for 2009–10 has been adjusted for environmental use by applying the approved method mentioned above. Victoria will continue to reduce its Cap as additional water is recovered for the environment under the Snowy, Living Murray and Commonwealth buy-back initiatives and the Northern Victoria Irrigation Renewal Project.

NEW SOUTH WALES

Continuing severe drought conditions in 2009–10 required changes to normal water management for the fourth water year in succession. In 2009–10, a range of drought contingency measures remained in force to ensure optimal sharing of the reduced volumes of water currently available. It is recognised that water management during this drought will require further development of the river models' ability to simulate these climatic extremes. New South Wales continues to support the IAG recommendations to take into account the impacts of this drought, to ensure that the Murray–Darling Basin Ministerial Council Cap assessment process continues to be robust.

Despite the sequence of record low water availability up to the end of 2009–10, New South Wales continues to implement and comply with the Murray–Darling Basin Ministerial Council Cap on diversions in all regulated river valleys within the Murray–Darling Basin.

As with previous reports, the 2009–10 report of the Independent Audit Group indicates that diversions in all New South Wales valleys are currently within Cap, with the exception of the state's Border Rivers, where Cap reporting will soon commence.

New South Wales notes that, as modelling of Cap for the Barwon–Darling component of the combined Barwon–Darling and Lower Darling Valley continues to improve, the overall assessment of performance for this valley has changed in 2009–10. While the Barwon–Darling component continues to have diversions in excess of Cap, the overall valley against which New South Wales reports is currently within Cap triggers. New South Wales has previously restructured entitlements in the Barwon–Darling Valley, reducing entitlements by two-thirds so that they now equal the long-term Cap, being the long-term average annual diversions. This was implemented to ensure that, over time, diversions would comply with the Cap.

However, the timeframe for bringing cumulative diversions since 1997–98 back within Cap cannot be identified clearly as this will depend on future seasonal conditions and water availability that cannot be forecast. As foreshadowed last year, New South Wales has taken a further step to reduce the likely timeframe for diversions to be brought back within Cap for the Barwon–Darling, by announcing a restricted annual diversion limit of 143 GL. Consistent with other unregulated water users within New South Wales, Barwon–Darling water users may access up to 200% of this limit in any water year, but no more than 300% in any three-year period. This limit is significantly less than the average diversions under Cap conditions.

New South Wales continues to make significant progress towards accreditation of valley models for Cap auditing under Schedule E of the Murray–Darling Basin Agreement, with the only remaining Cap models for major river systems to be presented for accreditation being the Barwon–Darling, and New South Wales Border Rivers.

QUEENSLAND

Queensland is pleased to be able to report on a year of record flows across our western streams where in excess of 6,000 GL flowed across the Queensland–New South Wales border.

These flows replenished significant wetlands in the Paroo, Warrego and Lower Balonne distributary system, with all of the accompanying environmental benefits. The flows also provided significant opportunity for water-harvesting ,with the second highest level of diversions since recording began in 1993.

The amendment of the Condamine and Balonne Resource Operations Plan on 26 March 2010 to include the Lower Balonne part of the catchment completes the implementation of water resource plans for the Queensland section of the Murray–Darling Basin. Submission of the Condamine and Balonne Cap proposal to the Murray–Darling Basin Authority (MDBA) also completes the establishment of caps for the Queensland catchments. Accreditation of the Cap models for the Border and Condamine and Balonne catchments is still outstanding.

Queensland is making further amendments to the Condamine and Balonne and Border resource operations plans. These amendments relate to a range of operational issues including the correction of inconsistencies, enhanced provisions for trading, alternative accounting system for unsupplemented water allocations and, specifically in the Condamine and Balonne, the inclusion of water sharing rules governing the beneficial use of coal seam gas water. The amendments will not impact on the Caps according to the original plans.

An amendment of the water resource plan for the Condamine and Balonne is also being progressed to incorporate the Central Condamine alluvial groundwater system.

The gifting of previously unallocated water to the Commonwealth formally announced in September 2008 was also finalised in 2010. Five separate water allocations were granted to the Commonwealth in January 2010 for a total of 10.6 GL of water across the Warrego, Nebine, Moonie and Border catchments.

Queensland regrets the delay in determining the Cap target for the Queensland Border Rivers catchment for the 2009–10 year. Queensland has provided a preliminary estimate of the target for the Independent Audit Group and will collaborate with New South Wales to extend the Border Rivers hydrologic model to allow reporting in the Water Audit Monitoring Report to be submitted to MDBA in late 2010.

To prevent a recurrence of this issue, Queensland and New South Wales are in the process of developing a protocol to ensure that both states are in a position to provide a more timely report for the 2010–11 water year.

With caps in place for all Queensland Murray–Darling Basin catchments, the state is focusing on metering stream diversions in the 2010–11 water year. Projects have commenced to either install new meters or upgrade existing meters in the mid-Condamine and Balonne rivers downstream to the New South Wales border (including the Lower Balonne). Larger installations that were originally deferred in the Warrego and Moonie catchments, pending resolution of issues with national metering standards, will also be completed in the coming water year.

AUSTRALIAN CAPITAL TERRITORY

Water use

The volume of gross diversions and net diversions for the Australian Capital Territory (ACT) was again lower than average and was in keeping with the trend since 2003. The volume of gross diversions and net diversions is the third lowest on record (i.e. since 1989–90). The decrease in diversions is largely due to the Australian Capital Territory water consumption being constrained by compliance to level 3 temporary water restrictions which have been applied since November 2006. The temporary water restrictions scheme applied up until 31 October 2010.

The Australian Capital Territory Government has continued to maintain its water demand management program which is designed to reduce consumer demand for potable water and in particular for outside water use.

Cap

Australian Capital Territory net diversions for 2009–10 are well within the agreed Cap.

The Australian Capital Territory has been developing a Cap model on potable demand of ACT and Queanbeyan water use. It is largely the model developed by ActewAGL for Australian Capital Territory and Queanbeyan water use. The model is climate adjusted and incorporates adjustments for population growth. The Australian Capital Territory will submit the final version of its Cap model later this calendar year for audit appraisal. As with other jurisdictions groundwater diversions are not part of the agreed Australian Capital Territory Cap although they are accounted for.

The Australian Capital Territory intends to resolve the outstanding interpretative differences regarding the terms of the agreed cap that applies to the ACT under Ministerial Council decision of May 2008. It is understood that should the matter not be resolved with the MDBA that a submission will be made to the Ministerial Council.

Other comments

It is not a responsibility for the Australian Capital Territory to manage and account for water under Commonwealth controlled water as the ACT simply does not have that power and that responsibility has not been given to the ACT. However, during 2009–10 progress has been made for the Australian Capital Territory to manage Commonwealth-controlled water owned within the ACT. The Australian Capital Territory will manage such water (about 1 GL) but this will be additional water owned and used by the Commonwealth for Commonwealth/national water needs within the ACT, for example for national institutional watering requirements.

The Australian Capital Territory will not have rights to this water as such. This will require legislation by both the Commonwealth and the Australian Capital Territory. The Australian Capital Territory Assembly enacted an amendment to the Water Resources Act to enable the ACT to manage this water. The Commonwealth has yet to pass the necessary legislation to ensure the transfer of management responsibility. Once the legislative arrangements have taken place the management of this water will be reported separately.

There has been no increase in the demand for water in the Australian Capital Territory for industrial use or by the Commonwealth and therefore no need to acquire additional water for the ACT.

Appendix B: Status of Cap models under Schedule E

	Status of model						
Cap Valley	Cap set	Model needed	Model built	Model name	Submitted for audit	Audited	Approved
New South Wales							
Intersecting Streams	×	✓	×				
Border Rivers	×	✓	✓	Border Rivers IQQM	×	×	×
Gwydir	✓	✓	✓	Gwydir IQQM	✓	✓	✓
Namoi/Peel	✓	✓	✓	Namoi IQQM	✓	✓	✓
			✓	Peel IQQM	✓	✓	✓
Macquarie/Castlereagh/ Bogan	✓	✓	✓	Macquarie IQQM	✓	✓	×
Barwon-Darling/Lower Darling	✓	✓	✓	Barwon-Darling IQQM	×	×	×
			✓	MSM	✓	✓	×
Lachlan	✓	✓	✓	Lachlan IQQM	✓	✓	✓
Murrumbidgee	✓	✓	✓	MBdgee IQQM	✓	×	×
Murray	✓	✓	✓	MSM	✓	✓	✓
Victoria							
Goulburn/Broken/Loddon	✓	✓	✓	GSM REALM	✓	✓	✓
Campaspe	✓	✓	✓	GSM REALM	✓	✓	✓
Wimmera-Mallee	✓	✓	✓	W-M REALM	✓	×	×
Kiewa/Ovens/Murray	✓	✓	✓	MSM	✓	✓	✓
South Australia							
Metro-Adelaide & Associated Country Areas	✓	✓	✓	HOMA	×	×	×
Lower Murray Swamps	✓	×					
Country Towns	✓	×					
All Other Uses of Water from the River Murray	✓	✓	✓	Regression	✓	✓	✓
Queensland							
Condamine/Balonne	×	✓	✓	Condamine IQQM			
Border Rivers & Macintyre Brook	✓	✓	✓	Border Rivers IQQM	✓	×	×
Moonie	✓	✓	✓	Moonie IQQM	✓	✓	×
Nebine	✓	✓	✓	Nebine IQQM	✓	✓	×
Warrego	✓	✓	✓	Warrego IQQM	✓	✓	×
Paroo	✓	✓	✓	Paroo IQQM	✓	✓	×
Australian Capital Territory							
	✓	✓	✓	Regression	×	×	×
Summary of 24 Basin Valleys	21	22	21		16	13	8

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 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 New South Wales and Queensland.
bulk entitlement	A perpetual entitlement to water granted to water authorities by the Crown of Victoria under the *Water Act 1989*.
carryover	An unused entitlement from one season that can be used in the next year.
channel capacity	The maximum rate at which water can be delivered through a river reach or an artificial channel.
COAG	Council of Australian Governments.
diversion	The movement of water from a river system by means of pumping or gravity channels.
diversion licence	Specified licences issued for a specified annual volume and diversion rate.
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 25° 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.
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.
impoundment	The storage of water diverted from a watercourse.
IQQM	Integrated quantity–quality model
irrigation	Supplying land or crops with water by means of streams, channels or pipes.
MDBA	Murray-Darling Basin Authority.
MDBC	The former Murray-Darling Basin Commission, subsumed by the MDBA in 2008
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.
Murray-Darling Basin Agreement	An agreement between the governments of the Commonwealth, New South Wales, Victoria, South Australia, Queensland and the Australian Capital Territory. The purpose of the Agreement (clause 1) is to 'promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water and other natural resources of the Murray–Darling Basin, including by implementing arrangements agreed between the contracting governments to give effect to the Basin Plan, the Water Act and state water entitlements. The current Agreement is the 2008 Agreement.
off-allocation	When unregulated tributary inflows or spills are sufficient to supply irrigation needs and downstream obligations.
on-farm storage	Privately owned storages used to harvest surplus flows or to store unused allocations for use in the following season.
overdraw	Water diverted in one season against a prospective allocation in the subsequent year.
overland flow	Water that runs off the land following rainfall, before it enters a watercourse and floodwater that erupts from a watercourse or lake onto a floodplain.
permanent transfer	The transfer of water entitlements on a permanent basis. The right to permanent transfers allows irrigators to make long-term adjustments to their enterprise and enables new operators to enter the industry.
private diverters	Licensed to operate privately owned pumps or diversion channels; includes river pumpers and diverters as well as town water supplies.
property right	In this context, the right to ownership of allocated volumes of water.
Ramsar wetland	A wetland listed on the Register of internationally significant wetlands established by the Convention at Ramsar.

regulated streams/waterways	Streams where users are supplied by releases from a storage. A water licence for a regulated stream specifies a base water entitlement defining the licence holder's share of the resources from a stream.
riparian	Of, inhabiting or situated on the bank and floodplain of a river.
salinity	The concentration of dissolved salts in groundwater or river water usually expressed in EC units.
temporary transfer	Water entitlements transferred on an annual basis.
unregulated streams	Streams 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 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.
water resource plans	Water resource plan. Plans developed under the Queensland *Water Act 2000* for allocating water between consumptive use and the environment.
water sharing plans	Water sharing plans developed under the New South Wales *Water Management Act, 2000* for equitable sharing and management of NSW water resources.

Australian Government

MURRAY–DARLING
BASIN AUTHORITY