Acknowledgments

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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Dear Mr Freeman

We have pleasure in submitting to you our Review of Cap Implementation 2008–09.

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

The 2008–09 audit has identified some important progress in each of the States and the ACT in establishing and/ or operationalising the Cap. Significantly we can report that 21 of the 24 valley models have now been developed of which 16 have been submitted for audit with 8 having been accredited. The IAG had previously noted that the extreme weather conditions and management responses current being experienced across the Basin has required that models may need to be recalibrated. It is pleasing to note that this recalibration work is underway, but still has to be completed across all relevant valleys.

There has been a delay in the finalisation of a Cap for the NSW part of the Border Rivers. However, it is expected that NSW and Queensland will have finalised all aspects of their Cap reporting arrangements for the Border Rivers by the end of 2010. A Cap for the Condamine-Balonne has been further delayed by legal action in Queensland. This matter is anticipated to be resolved in 2009–10, allowing the submission of a Cap for this valley system within six months of the resolution of all legal proceedings.

On the basis of our initial assessment of Cap compliance for the 2008–09 year, the cumulative diversions for the combined Barwon-Darling Lower Darling Cap valley have exceeded the trigger for a special audit. All other valleys for which Caps exist have not exceeded the Cap trigger.

For the 2008–09 audit, the timing for the review by the IAG has been bought forward to meet Ministerial Council requirements. Based on experience in this latest audit and discussions with the relevant States and the ACT, the IAG recommends that the 2010 audit be conducted in the last week of September with diversion reports to be forwarded to the IAG in the second week of September.

Yours sincerely

DENIS FLETT
Chairman

PAUL BAXTER
Member

TERRY HILLMAN
Member
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South Australia

Victoria

New South Wales

Queensland

Australian Capital Territory

Glossary
Following the adoption of Schedule E by the Council for operationalising, monitoring and reporting on Cap implementation, this audit was conducted in line with the requirements of Clause 15 of the Schedule.

At 4133 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.

The 2008–09 audit identifies important progress in each of the states and the ACT in establishing and/or operationalising the Cap. The key developments or issues are:

- setting of Caps on 21 of the 24 valleys in the Basin;
- development of models for 21 of the 22 valleys for which models are required;
- submission for audit of 16 of the valley Cap models and accreditation of 8 of these models with a further 5 audited (See Table 1);
- delays created by outstanding legal action preventing finalisation of a Cap for the Condamine-Balonne;
- provision of an annual Cap target for the Queensland section of the Border Rivers for the first time. NSW has yet to provide a Cap estimate for their section of the Border Rivers despite the existence of an interim IQQM model;
- some action taken to recalculate models to better reflect extreme conditions and management responses not experienced during the period over which the models were calibrated – although action is still required by some States;
- some adjustments made to models to address the impacts of the application of water restrictions on the calculation of Cap credits although further work is required;
- action being taken to prepare climate-adjusted Cap models for Metropolitan Adelaide and the ACT; and
- the cumulative debits for the combined Barwon-Darling/Lower Darling designated river valley exceeded the trigger for a special audit.

The Resource Operations Plan (ROP) for the Condamine-Balonne was released in draft form in April 2007 with finalisation expected by early 2008. However, a judicial review action has delayed finalisation of the plan. Queensland has committed to submitting a Cap proposal no later than six months after a Resource Operations Plan is in place for the whole of the Condamine-Balonne catchment. It is now expected that the ROP will be finalised and the Cap proposal submitted during 2010.
Table 1: Status of Cap Models under Schedule E

<table>
<thead>
<tr>
<th>Cap Valley</th>
<th>Cap Set</th>
<th>Model needed</th>
<th>Model built</th>
<th>Model Name</th>
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</table>
Executive Summary

Significant progress has been made on the finalisation and submission of models for independent assessment and accreditation. The IAG recognises that models may need to be recalibrated if conditions are experienced that are outside those that occurred during the period over which the model was originally calibrated. Modifications have been made for some models and these submitted for auditing.

Recognising the impact on the models that restrictions on water may have on the generation of Cap credits, the IAG has previously recommended that all Cap models used to calculate annual diversion targets as required by Schedule E, should incorporate mechanisms to account for water restrictions.

The IAG again notes the importance of updating of models, particularly when it is clear that existing model outcomes are not tracking changed climate and water availability outcomes.

As noted in the 2007–08 IAG Report, where a change has not been made to models, the IAG will reserve the right to make qualitative comments on the available information, and thereby provide full transparency to readers of the IAG’s Report to allow informed debate and action on the evidence available.

As part of its consideration of the effective operation of Schedule E accounting, the IAG notes that there is an emerging need to address the issue of accounting for water put aside for specific environmental purposes (eg. The Living Murray program or the Commonwealth buy-back of water). It is intended that long-term diversion Caps and annual diversion targets be adjusted after environmental entitlements are created, transferred or used in accordance with procedures prescribed in the Schedule E Protocol agreed by the Ministerial Council on 23 May 2008. To this end, methods need to be proposed by States for components of Cap adjustments and agreed by the Murray-Darling Basin Authority (MDBA) under the Schedule E Protocol.

Some States have already taken steps to identify environmental water entitlements, allocations and use in their reports to the IAG.

The IAG understands that a proposal has been formally sent to the MDBA by Victoria setting out methods for appropriate Cap adjustments for environmental water under the Schedule E Protocol. While the IAG is not privy to the details of this proposal, it does recommend that the Authority works with the States to agree the methods for how environmental water will be accounted for in long-term diversion Caps and annual diversion targets in future years.

Given the progress made on The Living Murray program and the Commonwealth water buy-back activity, the IAG recommends that the revised Cap accounting treatments be fully implemented for the 2009–10 water year.

For the 2008–09 water year audit, the IAG’s reporting requirements have necessitated bringing forward of the timing for reports from each of the States and the ACT. The IAG is required to complete its report to the Authority in time to allow its findings to be presented to the November Ministerial Council meeting.

The IAG is aware that 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 close-off of water accounts after the end of the water year be progressively reduced each year until that close-off 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 national water accounting 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 quantifying and reporting water diversions for individual jurisdictions.

Some jurisdictions have indicated that their diversion reports are subject to amendment, particularly for those valleys where reports are normally not made available until the end of the first quarter of the new water year (that is, the end of September 2009).

However, given the need to meet Ministerial Council requirements, all jurisdictions indicated that they were willing to take steps to ensure earlier reporting dates were met in the future. Thus, the IAG recommends that the 2010 audit be conducted in the last week of September with diversion reports to be forwarded to the IAG in the second week of September and that reporting time schedules be kept under review.

In summary, the detailed conclusions and recommendations reached by the IAG for 2008–09 by State and Territory are:
South Australia

- Diversions in 2008–09 were 486 GL compared to diversions of 423 GL in 2007–08;
- Diversions in 2008–09 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;
- South Australia has a reliable measurement system for both urban and irrigation uses;
- The South Australian All Other Purposes Cap model was approved by the Authority in November 2004 and the climate-adjusted Cap for 2008–09 was adjusted down to account for water restrictions. That recommendation is being adopted.
- The IAG has recommended that South Australia develop a climate-adjusted model of diversions from the River Murray for Metropolitan Adelaide. This model is currently being finalised and should be accredited by June 2010 and used for the 2009–10 year;
- South Australia still proposes to amalgamate the Lower Murray Swamps Cap with the All Other Purposes Cap while retaining the Environmental Land Management Allocation as a non-tradable component within the All Other Purposes Cap. This is supported by the IAG as it has no impact on the Cap volume within South Australia and is administratively more convenient;
- The IAG has previously recommended that an allowance 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 for the imposition of water restrictions. That recommendation is being adopted.
- To avoid any possible confusion, SA should remove from the All Other Purposes Cap, the 50 GL transferred from interstate for purposes of meeting environmental needs in the Lower Lakes;
- As with other States/Territories participating in or benefiting from environmental water improvement programs such as TLM and the Commonwealth buy-back, methods for Cap adjustment for environmental water entitlements, allocations and use will need to be developed, agreed with the MDBA and applied in future Cap reporting by SA.

Victoria

- Diversions in 2008–09 were 1,541 GL compared to diversions of 1,556 GL in 2007–08;
- Diversions for the Campaspe, Goulburn/Broken/Loddon and Wimmera–Mallee valleys in 2008–09 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;
- Cumulative diversions since 1997 for all valleys are in credit;
- The Murray/Kiewa/Ovens, Campaspe and Goulburn/Broken/Loddon models have been updated or subjected to some modification during the year which has resulted in a slight reduction in the Cap for each of these valleys;
- All water used by Bendigo via the Goldfields Superpipe and all water transferred to Ballarat via the Goldfields Superpipe has been treated as a Campaspe diversion as previously recommended by the IAG;
- 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);
- The IAG supports the adoption of Cap adjustment methods under the Schedule E Protocol that will provide for full and transparent accounting of water allocated, transferred and used for environmental uses such as TLM.

New South Wales

- Diversions in 2008–09 were 1,729 GL compared to 1,466 GL in 2007–08;
- Cap models have been approved for four NSW valleys and are currently being audited for two of the remaining five NSW valleys;
- The preliminary Schedule E accounting for 1997–98 to 2008–09 period indicates that cumulative actual diversions in the combined Barwon-Darling/Lower Darling Cap valley are 186 GL above 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;
- Cumulative Cap credits exist for other valleys in NSW;
• The IAG has been unable to assess the Cap compliance of the NSW Border Rivers because a Cap has still not been proposed;

• Upon completion of the integrated 1993–94 and “current conditions” model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam;

• NSW needs to advise on the timing and arrangements for the proposed capping of diversions on unregulated streams;

• As with other States/Territories, NSW needs to develop, have them agreed by MDBA and apply Cap adjustment methods under the Schedule E Protocol for adjusting the Cap for environmental water recovered, transferred or used under programs such as The Living Murray and the Commonwealth water buy-back.

Queensland

• Including overland flow harvesting, total diversion from the Queensland section of the Murray-Darling Basin was 359 GL in 2008–09;

• Excluding overland flow diversions, the diversion of 321 GL in 2008–09 was considerably less than the record diversion in 2007–08;

• Reflecting the lower flow levels in 2008–09, cross border flows were only 391 GL compared to more than 3,200 GL in 2007–08;

• Cap figures for Queensland Murray-Darling Basin valleys have now been set for the Warrego, Paroo, Nebine Catchments, the Moenie 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 current legal challenge has been resolved and Queensland expects to submit the Cap proposal within six months of the finalisation of the Plan;

• A metering program is being progressively rolled out as part of a Queensland state wide project to meter all entitlements. The project will ensure that reliable information on water use is available as the Resource Operation Plans are implemented.

Australian Capital Territory

• A climate-adjusted Cap for the ACT has now been agreed and work is proceeding on the development of a climate-adjusted model.

• Net diversions of 18.7 GL in 2008–09 were well below the Cap target of 29.7 GL calculated by the provisional ACT Cap model.

• The ACT needs to include all surface and ground water diversions in the reporting of “other diversions” under the agreed Cap.

• The ACT 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 the finalisation of the climate-adjusted model to be used to administer the Cap.

• Recognising that diversions by the Commonwealth should also be reported by the ACT as part of the use of the ACT Cap, discussions between the ACT and Commonwealth are welcomed and are expected to provide an agreement on measures necessary to meet this requirement during 2009–10.
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 E1 agreed that the IAG should have a role in auditing the implementation of the Cap.

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

In October 2005, the two person IAG comprising Dr Wally Cox and Paul Baxter was expanded to three members, with the addition of Denis Flett. This reflected the decision by Council to require the IAG to also undertake the audit of The Living Murray initiative and the need for succession planning. The Living Murray audit is set out in a separate report Review of The Living Murray – Implementation Audit 2008–09.

In October 2007, Dr Wally Cox resigned from the IAG and he has been replaced by Terry Hillman. In 2008, Terry Hillman was formally appointed as a member of the IAG. The IAG for the 2008–09 review therefore consists of Denis Flett, Paul Baxter and Terry Hillman.

In August 2007, the Council requested that the IAG undertake an annual review of how the activities and processes posing a risk to the shared water resources of the Murray-Darling Basin (the “risk factors”) are taken into account in water management arrangements for each valley and the Basin. The report of the IAG is provided in a separate report, Review of Risks to the Shared Water Resources – IAG Review 2007–08. The IAG has not been required to undertake a separate risk review as part of its 2008–09 Cap audit. However, the IAG has completed a review of the risk evaluation undertaken by the jurisdictions as a follow up to the Shared Water Resources Risk review and as a prelude to the completion of the Basin Water Plan.

This review of the risk evaluation task has been released as a separate report by the IAG.

The Council has also asked the IAG to review the Queensland Water Resource Planning process, and in time, the outcomes of the process. This process, involving significant community participation in both Queensland and northern NSW, was due for completion 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 2008–09 by the IAG has been prepared in response to the Council’s request and is based upon information made available to the IAG by each of the States and the ACT. The report sets out the broad background to the review and the process used by the IAG in forming its views and final conclusions. It then comments on the current status of compliance with the Cap in each of the five jurisdictions involved. It should be noted that Cap targets for Queensland’s Condamine-Balonne and NSW’s Border Rivers and Intersecting Streams still need to be established.

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

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1This was previously Schedule F to the Murray-Darling Basin Agreement [the Agreement] prior to 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 utilisation at 1993–94 levels of development;
  - the underlying level of demand for water in 1993–94; and
  - the system operating efficiency in 1993–94.

The Council also acknowledged that:

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

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

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

After considering a number of equity issues, the IAG previously advised its view that, subject to independent assessment by the IAG and advice to the Council, the Cap may be adjusted for certain additional developments which occurred after 1993–94.

The Cap should restrain diversions not development. With the Cap in place, new developments should be allowed provided that water for them is obtained by improving water use efficiency or by purchasing water from existing developments.
Because irrigation demand varies with seasonal conditions the diversions permitted under the Cap will vary from year to year. The system used to manage diversions within the Cap will therefore need to be flexible.

Following the Inter-Governmental Agreement to establish The Living Murray initiative, the IAG, with an expanded membership, was asked to undertake both audits. The Living Murray initiative will lead to modifications in setting and modifying Cap targets to reflect water saved and/or purchased for environmental use.

The 2007–08 Review of Cap Implementation identified that:

- At 4483 GL, diversion from rivers in the Murray-Darling Basin was the lowest on record reflecting drought conditions throughout most of the Basin. The results for 2007–08 continue the pattern of lowest diversions on record for the Basin, notwithstanding the high level of diversions in Queensland following significant rainfall events over the water year.
- Caps were still to be established for the Border Rivers and the Condamine and Balonne catchments in Queensland, and the Border Rivers in New South Wales. However, a Cap had been accepted by the Authority for the Queensland component of the Border Rivers and this was used to inform the 2007–08 audit;
- A Cap has been accepted for the ACT, but the Territory needs to undertake some additional reporting including surface and ground water diversions amongst “other” diversions under the agreed Cap. Additionally, the ACT needs to advise its proposed mechanics for reporting growth in demand for industry and adjustments to the Cap for population growth, and to provide for review, the climate-adjusted model to be used to administer the Cap.
- Five models had been accredited to date and others are currently being modified or recalibrated to take into account unprecedented drought conditions currently being faced in the Basin. There is action needed to adjust models for the impact of water restrictions on Cap credit outcomes and also to make adjustments to models in the context of current severe drought conditions.

The IAG indicated its expectation that all models would be amended when the need becomes apparent and the only reason for not making amendments would be if it can be demonstrated that the change is immaterial, the change will be part of a significant model or data change planned over the next 12 months or there is insufficient data upon which to make a change.

- The Commonwealth should take appropriate action to require the National Capital Authority and other Commonwealth agencies, as appropriate, to report to the ACT on an annual water year basis, on the consumptive use of Commonwealth controlled water in the ACT and also to report any trade in water to meet consumptive demand above current levels.
- South Australia should develop a model of diversions from the River Murray for Metropolitan Adelaide. This model should simulate urban demand, inflows from the local Adelaide Hills catchments and the operation of the supply system. It should be used to generate annual Cap targets and make allowances for water restrictions which would otherwise result in the artificial growth in Cap credits. The model should be accredited by June 2009.
- NSW should submit its “current conditions” modelling to independent audit.
- Water transferred out of the Goulburn/Broken/Loddon Cap valley by the Goldfields Superpipe should be treated as a return flow from the Goulburn system, reduce the annual Cap target in the Goulburn/Broken/Loddon Cap valley and increase the annual Cap target in the Campaspe Cap valley. Furthermore, all water used by Bendigo via the Goldfields Superpipe should be treated as a Campaspe diversion, while all water transferred to Ballarat via the Superpipe should be treated as a Campaspe diversion.
- In South Australia, diversions in 2007–08 were constrained to 423 GL as a result of restrictions due to ongoing drought conditions and were within the annual Cap targets for Metropolitan Adelaide, Country Towns and All Other Purposes Cap valleys;
• In Victoria, total diversions were 1,556 GL, with diversions for the Murray/Kiewa/Ovens, Campaspe Goulburn/Broken/Loddon valleys in 2007–08 being below annual climate and trade-adjusted Cap targets. However, diversions for the Wimmera-Mallee valley were slightly above the annual Cap targets for the year although below the trigger for a Special Audit.

• In NSW, diversions in 2007–08 were 1,466 GL compared to 2,352 GL in 2006–07. The preliminary Schedule E accounting for the 1997–98 – 2007–08 period indicates that diversions in the combined Barwon/Upper Darling and Lower Darling Cap valley are cumulatively 86 GL above Cap and also above the trigger for a Special Audit of 62 GL. A Special Audit was undertaken which confirmed that this valley had exceeded the Cap. The Special Audit also determined that given the proposed NSW approach to hold diversions at Cap levels, it is unlikely that the 325 GL debit for this valley will be reduced in the near future.

• In Queensland, diversions in 2007–08 including overland flow harvesting were estimated at 1,054 GL.

• In the ACT, net diversions of 15.6 GL in 2007–08 were well within the agreed Cap.

The IAG made a number of recommendations in the 2007–08 Cap Audit Report. Many of these recommendations related to modelling undertaken and the need for updating and recalibration of these models to maintain the integrity and reliability of 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 made over the last five years and briefly notes actions taken in response to recommendations from the IAG.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007–08</td>
<td></td>
</tr>
<tr>
<td>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</td>
<td>Some adjustments have been made to models for SA and Victorian valleys. Other States are still to address this issue, although the issue is more critical for the NSW valleys</td>
</tr>
<tr>
<td>South Australia to develop a climate-adjusted model for Metropolitan Adelaide diversions</td>
<td>Work has commenced on this modelling and is expected to be completed in 2010</td>
</tr>
<tr>
<td>NSW to submit its “current conditions” modelling for independent audit given the relevance placed upon these models for reporting performance against the Cap</td>
<td>NSW contends that it does not rely on this for Cap compliance. It is merely supporting information.</td>
</tr>
<tr>
<td>Treatment of diversions via the Goldfields Superpipe in Victoria to be standardised</td>
<td>The IAG recommendation has been adopted.</td>
</tr>
<tr>
<td>Commonwealth and ACT to take action to allow reporting of Commonwealth diversions within the ACT</td>
<td>Work on preparation of a climate-adjusted model is advanced but still awaiting advice on industrial demands and population adjusting mechanisms. Discussions are proceeding between the ACT and the Commonwealth.</td>
</tr>
<tr>
<td>Cap model and Cap estimate to be provided for the Border Rivers</td>
<td>Queensland Border rivers Cap finalised. NSW is yet to submit the Cap proposal for its component of the Border Rivers.</td>
</tr>
<tr>
<td>Finalisation of the Condamine-Balonne ROP together with the valley Cap and Cap model</td>
<td>Progress further delayed by legal proceedings in Queensland</td>
</tr>
</tbody>
</table>
## 2006–07

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Status/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>See comment above. This recommendation will be reported upon in future years against updated recommendations on this issue.</td>
</tr>
<tr>
<td>South Australia to develop a model of diversions from the River Murray for Metropolitan Adelaide to be accredited by June 2009</td>
<td>See comment above.</td>
</tr>
<tr>
<td>Inclusion of an allowance in the calculation of annual diversion targets for Metropolitan Adelaide, Country Towns, the Lower Murray Swamps and the All Other Purposes licence for the imposition of water restrictions.</td>
<td>See comment above.</td>
</tr>
<tr>
<td>The Mulwala Loss Allowance should not be subtracted from the NSW Murray Cap Diversion under the current rule. Should the Council choose to change the rule by amending the Register of Diversion Definitions in future to allow the Mulwala Loss Allowance subtraction, the Council should give prior consideration to the consequences of the decision on the integrity of the Cap;</td>
<td>Council has not yet decided to allow the Mulwala Loss Allowance to be deducted from the NSW Murray Cap Diversion. An Authority Committee has recommended it do so. In the meantime, the Mulwala Loss Allowance is not being deducted.</td>
</tr>
<tr>
<td>Upon completion of the integrated 1993–94 and current conditions model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam</td>
<td>Awaiting submission of the NSW Border Rivers Cap proposal.</td>
</tr>
</tbody>
</table>

## 2005–06

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Status/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>All models be audited and accredited with modified targets for completion of 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 prior to establishing a Cap for the ACT.</td>
<td>Of 24 Cap valleys, the Cap has been defined for 21 with Caps still to be defined for the Intersecting Streams, NSW Border Rivers and Condamine/Balonne. Cap models have been approved for 8 valleys and 13 have been audited (see Table 1).</td>
</tr>
<tr>
<td>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.</td>
<td>Skill shortages are still evident in some jurisdictions.</td>
</tr>
<tr>
<td>South Australia develop a model of diversions from the River Murray for Metropolitan Adelaide.</td>
<td>See comment above.</td>
</tr>
<tr>
<td>Treatment of the Mulwala Loss Allowance</td>
<td>See comment above.</td>
</tr>
<tr>
<td>Treatment of Pindari Dam</td>
<td>See comment above.</td>
</tr>
<tr>
<td>Queensland to place a proposal for Cap figures for each valley before Council before finalising the statutory process;</td>
<td>Cap proposal for all catchments with exception of Condamine-Balonne have been presented to Council via the IAG. In future years this item will be reported upon against more recent recommendations on this matter.</td>
</tr>
</tbody>
</table>
### 2004–05

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ACT, New South Wales and Queensland Governments finalise their Cap arrangements as a priority to provide confidence there is accountability and transparency in performance against Ministerial Council objectives for the Murray-Darling Basin river systems</td>
<td>Caps have now been agreed for the ACT, all NSW valleys except the Border Rivers and the Intersecting Streams and all Queensland catchments with the exception of the Condamine-Balonne. In future years this item will be reported upon against more recent recommendations on this matter</td>
</tr>
<tr>
<td>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</td>
<td>See comment above</td>
</tr>
<tr>
<td>Treatment of Pindari Dam</td>
<td>See comment above</td>
</tr>
</tbody>
</table>

### 2003–04

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland and New South Wales finalise the Inter-Governmental Agreement and establish the framework to enable Cap targets to be established for the Border Rivers</td>
<td>Intergovernmental Agreement (IGA) formally signed and Queensland Border Rivers Cap now approved by Council</td>
</tr>
<tr>
<td>South Australia and Victoria have all models accredited by 30 June 2005, New South Wales by June 2006 and Queensland by June 2007</td>
<td>See comments above</td>
</tr>
<tr>
<td>Upon completion of the Integrated 1993/94 and current conditions model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam.</td>
<td>See comments above</td>
</tr>
</tbody>
</table>

### 2002–03

<table>
<thead>
<tr>
<th>Activity</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Cap still needs to be finalised for the NSW 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 NSW on an appropriate allowance for the Pindari Dam</td>
<td>See comment above</td>
</tr>
<tr>
<td>The IAG recommends that each State and the ACT, 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</td>
<td>See comment above</td>
</tr>
<tr>
<td>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</td>
<td>See comment above</td>
</tr>
<tr>
<td>Upon completion of the integrated 1993/94 and current conditions model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of the appropriate allowance for the enlarged Pindari Dam.</td>
<td>See comment above</td>
</tr>
</tbody>
</table>
3. AUDIT PROCESS

For the purposes of this 2008–09 audit of progress with the implementation of the Cap, the IAG has adopted a consultative approach, where relevant, designed to:

- clarify expected Cap outcomes where relevant for each State;
- gather available statistical information on actual levels of diversions in 2008–09 as a means of quantifying overall diversions and commenting on Cap compliance;
- identify progress made in implementing proposed management rules for capping water diversions;
- highlight particular problems being encountered by relevant jurisdictions as regards the finalisation or implementation of management rules; and

The IAG met with representatives of each of the States, the Commonwealth and the ACT during the period 28 September to 2 October 2009. In relation to the Cap, the format of each meeting was to compare water usage in 2008–09 with Cap targets, to discuss progress with the establishment of models and management frameworks to achieve targets and to discuss issues of possible concern.

For the southern Murray-Darling Basin States (New South Wales, Victoria, South Australia), the ACT and Commonwealth, the IAG also discussed progress in implementing The Living Murray initiative. The results of these discussions are reported separately in the Audit of The Living Murray Implementation 2008–09.

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

While acknowledging the valuable contribution made by each of the States, the ACT, the Commonwealth and members of the MDBA staff, the findings and conclusions presented in this report are entirely those of the IAG.
4. AUDIT OF 2008–09 CAP IMPLEMENTATION

4.1 South Australia

4.1.1 The Cap

As a result of decisions by the Ministerial Council in December 1996 and March 2001 and the 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 tradable 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-tradeable Environmental Land Management Allocation (ELMA); and
- 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 decisions has been approved by the Murray-Darling Basin Commission (now Authority) and is used to determine the annual climate-adjusted Cap target for this category of diversion. For all other categories, there has not been a need for a climate-adjusted Cap model. In years where water restrictions apply to entitlement holders, the Cap will be adjusted to reflect this restriction. The 2008–09 Cap assessment is the first year where restrictions have been implemented into the Cap target.

In response to the Cap Audit Report 2007–08, work has been under way in the preparation of a climate-adjusted model to replace the five-year rolling average Cap for Metropolitan Adelaide.

4.1.2 2008–09 Usage

Overview

Low inflows were again experienced across the Murray-Darling Basin system, severely impacting water resource availability, irrigation entitlements and the environment in South Australia.

River Murray water resource availability to South Australia was again severely constrained due to drought and subsequent low River Murray system inflows and storage levels. South Australia received a total flow across the border of 1,180 GL including trade adjustments and provision of some environmental water. This was the third lowest flow across the border since 1902–03 and well below the long-term median (approximately 4,600 GL). The environment continues to suffer major ecological decline, particularly in Icon Sites such as the Riverland (Chowilla), Lower Lakes and Coorong. There have been no freshwater releases from the barrages into the Coorong since early March 2007.

The environment below Lock 1 has been significantly impacted by low water availability and other major threats such as acid sulphate soils, major ecological decline and salinity, particularly around the Lower Lakes. Water levels below Lock 1 were minus 0.4 m AHD at the start of July 2008 and had fallen to minus 0.9 m AHD at the end of June 2009. Wind further exacerbates actual daily water levels below Lock 1 and at some locations water levels reached minus 1.2 m AHD.

A number of management actions were undertaken around Lakes Alexandrina and Albert including emergency pumping of water from Lake Alexandrina into Lake Albert to prevent acidification. A number of different treatment and remediation options are being undertaken in both lakes including bioremediation and liming.

Low water levels have also adversely impacted irrigation water use within the Lower Murray Reclaimed Irrigation Areas (LMRIA). Gravity irrigation is the primary delivery mechanism and the water levels declined to the point whereby the majority of irrigators could not access water without substantial modification to the inlet channels. In some circumstances pumps were installed to deliver water into the channels.

Other issues such as cracking of levee banks and irrigation bays also forced irrigators to change irrigation methods and location of water use. The LMRIA has experienced a gradual “drying out” of irrigation bays due to low allocations and water levels. This, along with low water levels, has caused major cracking in some areas.
Irrigation in these areas has now 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 resource availability, restrictions on River Murray water use were again applied to Metropolitan Adelaide, Country Towns, irrigation and other allocations. This was the sixth consecutive year when entitlements have been restricted from the beginning of a water year.

In response to the prospect of low seasonal allocations, South Australia implemented a Critical Water Allocation Scheme (CWAS) to support viable permanent plantings along the River Murray in South Australia. The CWAS involved directly purchasing 61 GL for over 1,300 irrigators and the volume of water allocated to irrigators was based on crop survival requirements only. This program was well received by regional River Murray communities heavily reliant on River Murray water use.

With the advent of ongoing low inflows and restricted availability, South Australia’s diversions from the River Murray were at the second lowest level since the implementation of the Cap. If the CWAS was not available, irrigation diversions would have been lower.

South Australia was also required to secure 201 GL for the Critical Human Water Needs reserve for 2009–10. This reserve is a requirement of First Ministers and also under the Water Act 2007.

South Australia implemented the River Murray Drought Water Allocation Decision Framework for 2008–09 water year. The Framework allowed for adaptive management and allocation of resources throughout the year and the following broad assumptions were applied:

- allocation to irrigation licences is the first priority in June, July and August;
- from September onwards, if the Critical Human Water Needs (CHWN) reserve for 2009–10 is less than the target end of month volume, all improvement is directed to the reserve;
- from September onwards, any improvement in excess of the target volume for the CHWN reserve will be available to irrigation licences if the licence allocation is < 25%;
- if the licence allocation is \( \rightarrow 25\% \), a portion of the improvement available to licences will be available for critical environmental needs up to 10 GL; and
- no allocation will be made to irrigation licences after March 2009. Instead any improvement after this time will be allocated to refilling the Lower Lakes.

Special water sharing arrangements were implemented again for the southern connected Murray-Darling Basin in 2008–09. Under this arrangement each State was responsible for accumulating Critical Human Water Needs for 2009–10. South Australia secured 201 GL through a process involving allocation of improvements, market purchases and adjustments to River Murray operations to save water through reduced evaporative losses.

A small initial allocation of 2% of entitlement for River Murray entitlement holders was announced on 1 July 2008 as a result of low water resource availability. As South Australia’s allocation from the shared resources of the southern connected Murray-Darling Basin improved, the allocation was increased to 18% of entitlement in February 2009.

In addition to the 18% allocation, a total of 94 GL was ‘carried over’ from 2007–08. This was the second time that carry-over of unused allocation had been permitted in South Australia. The carry-over was a combination of unused water from 2007–08 and trade water purchased for use in 2008–09.

Total South Australian diversions from the River Murray for 2008–09 were 486 GL, the second lowest diversion since the implementation of the Cap. The diversions comprised:

- 149.5 GL for Metropolitan Adelaide and associated country areas;
- 37 GL for Country Towns;
- 11.3 GL for the Lower Murray Swamps (including ELMA, which is restricted to the same percentage as irrigation allocations);
- 274.1 GL for metered consumption under the All Other Purposes Cap component; and
- 14.1 GL for non-metered consumption under the All Other Purposes Cap component.

The total diversion was only 77% of the annual average diversion since 1997.
Table 3 provides details on the temporary trades including the sources for the 2008–09 water year.

Table 3 River Murray Interstate Water Trade 2008–09

<table>
<thead>
<tr>
<th>Interstate Trade</th>
<th>Temporary Trade (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From SA to Victoria</td>
<td>3.3 GL</td>
</tr>
<tr>
<td>From SA to NSW</td>
<td>0.35 GL</td>
</tr>
<tr>
<td>Total out of SA</td>
<td>3.65 GL</td>
</tr>
<tr>
<td>Into SA from Victoria</td>
<td>22.5 GL</td>
</tr>
<tr>
<td>Into SA from NSW</td>
<td>317.4 GL</td>
</tr>
<tr>
<td>Total into SA</td>
<td>339.9 GL</td>
</tr>
</tbody>
</table>

The majority of temporary water purchases came from the Murrumbidgee Valley.

Permanent (allocation) trade continues to come from the Lower Murray Swamps and a total of 2.0 GL was permanently traded to the All Other Purposes Cap.

A total of 408.8 GL of temporary trade was recorded within South Australia including 2.9 GL from the Lower Murray Swamps Cap valley. The temporary trade figure also includes water traded by irrigation trusts managed by Central Irrigation Trust (CIT).
4. Audit of Cap Implementation 2008–09

**Metropolitan Adelaide and Associated Country Areas Water Use**

The Metropolitan Adelaide Water Supply System utilises two major water resources:
- natural catchment intakes from the Mount Lofty Ranges;
- the River Murray.

Normally the Mount Lofty Ranges is the primary source of water due to 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 remained at low levels during 2008–09. Consequently there was a greater demand on the River Murray and 149.5 GL was diverted.

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

The five-year rolling total (excluding the “First Use Licence” component) diversion for the Metropolitan Adelaide was 562.7 GL leaving an unused portion of 87.3 GL (see Table 4). In 2006–07 this rolling total included the additional 60 GL pumped during that year for use during 2007–08.

**Country Towns Water Use**

For 2008–09, as part of the position agreed by First Ministers, South Australia was allocated 201 GL for CHWN. Of this volume, a restricted base allocation of 31 GL was provided to Country Towns.

Country Towns used 37 GL in 2008–09. To cover the shortfall between the First Ministers endorsed allocation of 31 GL and the total water used, SA Water leased a total of 6 GL of unused allocation on the temporary water market. This resulted in a total usable allocation of 37 GL and zero Cap credits.

Outdoor watering restrictions applied to all 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. Enhanced Level 3a restrictions were maintained during 2008–09.

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 commencement of each water year and as noted above, an additional trade of 6 GL was required to allow for use at level 3a water restrictions in 2008–09. Table 5 below outlines the revised Country Towns Cap credits for the implementation of the gazetted restriction.

**Table 4: Metropolitan Adelaide Cap Assessment**

<table>
<thead>
<tr>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Gross Diversion</td>
<td>71.6</td>
<td>73.9</td>
<td>203.1</td>
<td>89.4</td>
<td>149.5</td>
<td>587.5</td>
</tr>
<tr>
<td>First Use Licence</td>
<td>8.8</td>
<td>16.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>24.8</td>
</tr>
<tr>
<td>Rolling Diversion Against 650 GL Cap</td>
<td>63.2</td>
<td>57.9</td>
<td>203.1</td>
<td>89.4</td>
<td>149.5</td>
<td>562.7</td>
</tr>
<tr>
<td>Five Year Cap</td>
<td></td>
<td></td>
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<td></td>
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<td>650.0</td>
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<tr>
<td>Credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>87.3</td>
</tr>
</tbody>
</table>

**Table 5 Country Towns Cap Credits**

<table>
<thead>
<tr>
<th></th>
<th>97–98</th>
<th>98–99</th>
<th>99–00</th>
<th>00–01</th>
<th>01–02</th>
<th>02–03</th>
<th>03–04</th>
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<th>06–07</th>
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<tbody>
<tr>
<td>Annual allocation</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>95%</td>
<td>100%</td>
<td>60%</td>
<td>62%</td>
<td>62%</td>
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<tr>
<td>Credit</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Cumulative Credit</td>
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<td>28</td>
<td>42</td>
<td>54</td>
<td>56</td>
<td>56</td>
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<td>65</td>
<td>67</td>
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</tbody>
</table>
Lower Murray Swamps Water Use

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

Until recently, the irrigated areas were un-metered with a specific number of waterings being permitted each year. If water was transferred out, the appropriate portion of irrigated land was retired. The Cap is defined as net water use and no Cap credit has been claimed since commencement.

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 LMRIA have been treated in the same manner as all other irrigation licences and were set at 18% for 2008–09.

Over the last four years a substantial amount of water has been permanently traded out of the Lower Murray Swamps Cap.

A total of 11.3 GL was diverted for irrigation and ELMA use in 2008–09. This diversion figure is preliminary and includes metered data where available [including ELMA]. Where meter readings are not yet available it assumes 18% authorised use. Issues are currently being experienced with site access due to unstable ground presenting an occupational health and safety risk for meter readers.

South Australia has proposed a merger of the remaining Lower Murray Swamp Cap into the All Other Purposes Cap. This merger has previously been supported by the IAG and South Australia is working with the MDBA to implement the merger. This process is nearly complete and a report will be provided to the MDBA’s Water Audit Panel. Completion is anticipated by the end of 2009.

In 2007–08 the highland component of the Lower Murray Swamps (9.3 GL) was permanently transferred to the All Other Purposes Cap and a similar arrangement is preferred by South Australia for the remaining irrigation and ELMA entitlements. The majority of irrigation within the Lower Murray Swamps Cap Valley now occurs in adjacent highland areas due to problems with direct irrigation on the swamp flats.

The 2007–08 IAG Report supported this as a logical step forward that would make trade and measurement of this component more administratively convenient. It is proposed that the non-tradable ELMA will also be merged into the All Other Purposes component, however it will remain completely non-tradable 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 consequently require the approval of Ministerial Council during 2009–10

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 LMRIA.
4. Audit of Cap Implementation 2008–09

This was adjusted to take into account the final announcement of 18% allocation. The climate and restriction adjusted Cap for 2008–09 is 94.9 GL. In addition, there was an adjustment of 373.1 GL for water trade and a -50 GL adjustment for environmental water use due to the fact that 50 GL of the traded water was used for maintaining water levels in the Lower Lakes. Thus the climate, restriction and trade adjusted annual Cap target was 418.0 GL. The method for calculating restrictions was discussed and agreed between officials from SA and the Murray-Darling Basin Authority in mid 2009.

The annual Cap credit for 2008–09 is 129.0 GL and the cumulative Cap credit since 1997–98 is now 596.9 GL. This cumulative figure is lower than the number in last year’s IAG report. This is due to a recalculation of the cumulative Cap credits taking into account water restrictions in previous years. Table 6 outlines the revised All Other Purposes Cap register taking into account restrictions and the impact on annual and cumulative Cap credits. The cumulative credit implies that All Other Purposes diversions have been 11% below Cap since 1998–98.

The All Other Purposes Cap valley is administered under a debit and credit arrangement. This means that when water use is below Cap, credit is allocated to that valley for that water year or vice versa if use is above the Cap. The credit and debit arrangement is cumulative, allowing a valley to accumulate credits as a reward for using less water than the Cap allows in a water year.

<table>
<thead>
<tr>
<th>Table 6 All Other Purposes Cap with Restrictions for Announced Annual Allocations</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Annual climate, trade and restriction adjusted Cap</td>
</tr>
<tr>
<td>Recorded diversion</td>
</tr>
<tr>
<td>Annual Cap credit</td>
</tr>
<tr>
<td>Cumulative Cap credit</td>
</tr>
</tbody>
</table>
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 portion of the recorded diversion not metered. All diversions remained within the annual Cap targets and all valleys remain in cumulative Cap credit.

For 2007–08, as part of the negotiated position agreed by First Ministers, normal water sharing rules were suspended and South Australia was allocated 201 GL for CHWN. Of this allocation 150 GL was for Metropolitan Adelaide and Associated Country Areas.

Restrictions on Allocations

South Australia agreed in principle with the IAG’s 2007–08 Cap recommendation that annual diversion targets should be adjusted to account for announced restrictions on allocations to ensure that artificial Cap credits are not generated for the different Cap valleys. This concept of adjusting the Cap to reflect the final announced level of allocation is seen as appropriate for the All Other Purposes and Country Towns Caps. However South Australia argues that each Cap valley would need to be managed differently. This is due to the need to supply Country Towns with a base allocation for critical human water needs as per the First Ministers agreement.

Allocation of water to the different Cap valleys in South Australia does not involve providing the same volume of water to each area and therefore the same restriction cannot apply.

In its 2007–08 report, the IAG recommended that a restriction allowance be inserted into the models used in order to reduce the Cap calculation by the same factor as the final allocation. This action would align the Cap allowance with the final allocation for the water year when restrictions are applied and where appropriate, this has been implemented for 2008–09.

Implementation of restrictions has resulted in no generation of annual Cap credits for the Country Towns and Lower Murray Swamps Cap valleys in 2008–09.

The Cap for All Other Purposes was restricted by the low allocation of only 18%. However, due to the large amount of temporary trade, this resulted in an annual Cap credit of 129.8 GL. The method for applying restrictions to the All Other Purposes Cap has been discussed with the MDBA and agreed by South Australia at officer level.

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.

A significant amount of work has now been undertaken to develop a new model for Metropolitan Adelaide. Although the new model was not finalised in 2008–09, an initial model has been developed for internal discussion. The new model will apply an annual climate-adjusted approach to determine annual Cap targets which will replace the five year rolling average approach.

It is anticipated that the new Cap model will be finalised during 2009 and ready for implementation for the 2009–10 Cap assessment. South Australia will work closely with the MDBA to have the new model independently audited and approved by the Murray-Darling Basin Authority prior to the end of 2009–10.

Further to these measures is the implementation of the Water for Good Strategy released in June 2009, which focuses on providing South Australia with the most secure water supply system in southern Australia. A number of actions are to be implemented throughout the State and the strategy provides more than 90 deliverable actions to diversify the State’s water resources, improve water conservation and efficiency and improve and modernise the water industry. Key actions include:

- doubling the capacity of the Adelaide Desalination Plant to 100 GL;
- increasing stormwater harvesting and wastewater reuse for key areas e.g. horticulture, agriculture and some areas of industry; and
- mandated water sensitive urban design will be introduced through new planning regulations which will apply to all new residential and commercial urban development.

4.1.4 Monitoring and Reporting

Urban consumption (Metropolitan Adelaide and Country Towns) and irrigation consumption under the All Other Purposes Cap component is reliably metered (97% metered). South Australia continues to make improvements to ensure that the standard of metering of direct diversions is maintained at satisfactory levels.
Metering of the Lower Murray Swamp irrigation areas is now complete although there has been some loss of meters due to riverbank slumping.

South Australia, through SA Water, transports water from the Murray to other basins for irrigation, i.e. Barossa Valley and Clare Valley. 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 Proposals to Refine Implementation in 2009–10

South Australia will continue to improve its capacity to manage Cap targets and implement measures to reduce reliance on the River Murray.

During 2009–10, the following will be completed by South Australia and require approval:

- merging the All Other Purposes and Lower Murray Swamps Cap valleys;
- implementation of a new Metropolitan Adelaide and Associated Country Areas Cap model; and
- formal approval of the implementation of restrictions to the All Other Purposes and Country Towns Cap valleys.

Current initiatives by South Australia under the Waterproofing Adelaide program incorporate recycling of treated wastewater and stormwater and further development of conservation measures for industry and households. The expanded desalination plant will provide security for Adelaide's drinking water supply in times of low inflows or water quality problems, and enable greater operational flexibility by providing an additional source from which to draw water. In order to meet Adelaide's growth and consequent demand for drinking water, SA Water will continue to utilise its metropolitan water licence from the River Murray to supplement local reservoir supplies and will operate the desalination plant over a range of flow rates depending on seasonal conditions and operational requirements. The desalination plant will lower Adelaide's reliance on the River Murray and manage the river in a sustainable way.

4.1.6 IAG Assessment

As in 2007–08, consumption in South Australia in 2008–09 was significantly constrained. Diversions for Country Towns, Metropolitan Adelaide and All Other Purposes were below Cap. Diversions for the Lower Murray Swamps are now fully metered although some estimates had to be made for usage due to loss of meters as a result of riverbank slumping.

Metropolitan Adelaide consumption over the last five years was 562.7 GL (excluding the 'First Use Licence') compared with the five-year rolling target of 650 GL. This level of usage includes the 60 GL pumped during 2006–07 for use in 2007–08. Compliance with this Cap has been enhanced by transfer over the last five years of 24.8 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 SA develop a climate-adjusted model for the Metropolitan Adelaide Cap. Work is now well advanced on this model and the IAG anticipate that a climate-adjusted model for Metropolitan Adelaide will be applied in 2009–10 following appropriate audit and approval of the model.

South Australia has also adopted the IAG’s recommendation that adjustments be made to the All Other Purposes, Country Towns and Murray Swamps model and caps to take into account the impact of water restrictions on the determination of Cap credits. This recommendation has been adopted, and for 2008–09 the All Other Purposes model is now a climate-adjusted model with adjustments for years in which water restrictions have been applied.

In considering issues arising from accounting for water designated under The Living Murray (TLM) program, the IAG has been conscious of the need to reflect in the Cap outcomes, the Long-term Cap Equivalent (LTCE) values of water held for TLM purposes. SA acknowledges the need for some form of reporting of TLM allocations.

As noted in Section 4.2.4 later, Victoria has submitted a proposal to the MDBA setting out a methodology to account for the LTCE of water transferred to special environmental licences under programs such as TLM. While the IAG is unable to comment on the specifics of the Victorian proposal, it does support in principle, any process whereby these environmental licences are clearly identified and a public and transparent adjustment is made to the Cap through the provisions of Schedule E accounting.

In 2008–09, SA transferred 50 GL from interstate to the All Other Purposes Cap to provide water for the Lower Lakes. This transfer of Cap has been recorded in the Cap for All Other Purposes. The IAG notes however, the transfer of Cap in this way has an unintended consequence of increasing the All Other Purposes Cap by 50 GL which in effect will be allocated to the environment noting this 50 GL was traded onto a licence.
To avoid any future confusion, considering the purpose of this transfer, the 50 GL should be removed from the All Other Purposes Cap and treated as an allocation to the environment. The IAG has made this adjustment in Table 2 above when reporting on SA's compliance with the Cap in 2008–09.

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 (although their use in 2008–09 has been affected by bank slumping problems). The IAG acknowledges the full and clear presentation of data on water use under the Cap provided by SA.

4.1.7 Conclusions/Recommendations

- Diversions in 2008–09 were 486 GL compared to diversions of 423 GL in 2007–08;
- Diversions in 2008–09 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;
- South Australia has a reliable measurement system for urban and irrigation uses;
- The South Australian All Other Purposes Cap model was approved by the Authority in November 2004 and the climate-adjusted Cap for 2008–09 was adjusted down to account for water restrictions in the latest year;
- The IAG has recommended that South Australia develop a climate-adjusted model of diversions from the River Murray for Metropolitan Adelaide. This model is currently being finalised and should be accredited by June 2010 and used for the 2009–10 year;
- South Australia still proposes to amalgamate remaining Lower Murray Swamps Cap components with the All Other Purposes Cap while retaining the Environmental Land Management Allocation as a non-tradable component within the All Other Purposes Cap. This is supported by the IAG as it has no impact on the Cap volume within South Australia and is administratively more convenient;
- The IAG has previously recommended that an allowance 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 for the imposition of water restrictions. That recommendation is being adopted.
- To avoid any possible confusion, SA should remove from the All Other Purposes Cap, the 50 GL in water transferred from interstate for purposes of meeting environmental needs in the Lower Lakes;
- As with other States/Territories participating in the TLM program, the amount of TLM diversions will need to be allowed for in future Cap reporting by SA.
4.2 Victoria

4.2.1 The Cap

Victoria is using computer simulation models, calibrated to 1993–94 level of development, to calculate annual Cap targets for the major regulated systems. Regression models are being used for the smaller systems. [See Table 7.]

The model for Goulburn/Broken/Loddon and Campaspe valleys was accredited by the then Murray-Darling Basin Commission (MDBC) at meeting 93 on 4 September 2007. In accordance with the 2007–08 IAG Cap Report, the Campaspe River transmission loss has recently been revised to ensure that it operates satisfactorily for a wider range of hydrological conditions including the recent severe drought. A report documenting the changes and seeking formal approval has been submitted to the MDBC.

Improvement to the transmission loss produced significantly lower Cap targets for the Campaspe valley in 1997–98, 2004–05 and 2005–06, years when the change reduced the modelled seasonal allocation. This caused the cumulative Cap credit up to June 2008 to reduce by 30 GL. The updated model has been used to calculate 2008–09 Cap targets and the cumulative credits presented in this report.

As a result of revised model input data for May and June 2008, the 2006–07 Cap target for Goulburn/Broken/Loddon valley changed slightly compared to figures reported in last year’s Cap report (less than 0.1% of the long-term Cap).

MDBC originally 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 Commission at meeting 96 on 26 August 2008.

An updated version of the Murray Cap model, which includes improved modelling of the Lower Darling, was used to calculate the 2008–09 Cap targets and cumulative credit up to June 2008. The improvements include 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. There were also 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 prior to 1997.

The above model improvements caused only a small change (3.2 GL) to the Victorian cumulative Cap credit up to 2008. A report documenting the changes will be prepared for consideration by Victoria and NSW before seeking Murray Darling Basin Authority’s approval.

Historical Goulburn and Murrumbidgee flows were incorrectly used in the Murray Cap model to calculate Cap targets last year. When these were replaced with 1993–94 level of development outflows from the Goulburn and Murrumbidgee Cap models, the cumulative Cap credit for Victorian Murray reduced by 126 GL. The combined effect of model and data changes caused a 123 GL reduction to the cumulative Cap credit.

Grampians Wimmera-Mallee Water (GWMW) have developed a Cap model for the Wimmera-Mallee valley. A report documenting model assumptions, calibration and Cap model results has been submitted to the MDBC for accreditation. This model has been used to calculate the 2008–09 Cap targets, the cumulative credits since 1997–98 and the long-term Cap for this valley.

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

Table 7: Victoria Cap Auditing Models Status

<table>
<thead>
<tr>
<th>Valley</th>
<th>Auditing Tool</th>
<th>Comment</th>
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<tbody>
<tr>
<td>Goulburn/Broken/Loddon</td>
<td>GSM REALM Model (Final)</td>
<td>Accredited</td>
</tr>
<tr>
<td>Campaspe</td>
<td>GSM REALM Model (Final)</td>
<td>Accredited – corrections to be approved</td>
</tr>
<tr>
<td>Murray</td>
<td>Murray Simulation Model (Final)</td>
<td>Accredited – updates to be approved</td>
</tr>
<tr>
<td>Kiewa/Ovens</td>
<td>Regression Model</td>
<td>Accredited</td>
</tr>
<tr>
<td>Wimmera-Mallee</td>
<td>Preliminary W-M REALM Model</td>
<td>Submitted for accreditation</td>
</tr>
</tbody>
</table>
4.2.2 2008–09 Diversions

Overview

Irrigation areas supplied from the Murray and Goulburn systems in 2008–09 experienced respectively the lowest and second lowest final water allocations on record. The Broken, Campaspe, Loddon and Bullarook systems had zero final allocations. The Broken allocation was the lowest on record and Campaspe and Loddon allocations were equal lowest. The allocation for the Bullarook system has been zero for the past two years.

At the start of July 2008, a zero allocation was announced by Goulburn-Murray Water (GMW) for all systems. Final allocations for the Murray and Goulburn systems were 35% and 33% of High Reliability Water Share (HRWS) respectively. Broken, Campaspe, Loddon and Bullarook systems all had zero final allocations.

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 qualification of rights was removed on the Goulburn and Murray systems once allocations reached 20% HRWS.

July was generally wetter than average but the following three months were dry in all areas. Late spring-early summer was wet with rainfall totals well above average. At a number of locations, monthly rainfall totals were more than twice and even three times the average during the period from November to December. With a few exceptions rainfall for the remainder of the year was well below average. Some areas recorded little or no rain during the months of January and February.

The major storages on the Goulburn, Campaspe, Loddon and Broken systems all failed to fill. However, both Lake Buffalo and Lake William Hovell on the Ovens system filled to capacity. Pumps were installed to access additional water from Waranga Basin at supply rates not possible under gravity to increase overall water availability. This was the fourth time since 2003 that pumps have been used at Waranga Basin. At Tullaroop reservoir, pumps were used to maintain a small flow in Tullaroop Creek as gravity supply was not possible. For most of the year, the qualified release was only 1.3 ML/day but occasionally small freshes were made up to 7.7 ML/day to improve the health of the creek.

Inflows to the Campaspe and Loddon systems were only 2% and 7% of average respectively. Eildon, Hume and Dartmouth storages all had annual inflows well below average. The inflow to Lake Eildon since November 1996, when the storage was last full, is the lowest on record.

All major storages were drawn down to very low levels at the end of the season. Lake Hume was drawn down to 2.1% of capacity by late April 2009, the second lowest on record after 1968. At the end of June 2009, Lake Dartmouth was holding only 21.4% of capacity.

Diversions for 2008–09 from the Murray/Kiewa/Ovens valley were above the Cap target while those for the Goulburn/Broken/Loddon and the Campaspe were below the annual cap target. The Wimmera-Mallee valley had significant water savings through the Northern & Wimmera-Mallee Pipeline Projects and diversions from this valley were below the interim Cap target for 2008–09.

All four Victorian valleys have accumulated Cap credits up to 30 June 2009. A comparison of 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 final accuracy checking is yet to be undertaken.
4. Audit of Cap Implementation 2008–09

The initial 2008–09 allocation on the Goulburn system was zero. An allocation of 4% was announced on 15 September 2008 after which the allocation increased in small steps to a final allocation of 33% of HRWS on 1 April 2009. This is the eleventh year in a row that no Low Reliability Water Share allocation has been announced.

Lake Nillahcootie inflow for 2008–09 was 36% of average and the storage reached a maximum of 33.2% in late September 2008. In early September, Lake Mokoan reached only 6.7% of capacity and by late February 2009 the storage had fallen to 1% of capacity which was effectively dead storage, the lowest on record.

No irrigation allocation was made available for the Broken System in view of the very poor resource position. Releases from Lake Mokoan continued for most of the year and the total release was 4.3 GL. Very low carryover volumes combined with inflows well below average resulted in the Murray Flora and Fauna account for GVA water delivered via the Campaspe River.

Goulburn/Broken/Loddon

Resource availability

Annual rainfall at Eildon was 77% of average for 2008–09 and the annual inflow to Lake Eildon was only 37% of average. The cumulative inflow to Lake Eildon from October 1996 to the end of June 2009 was the lowest on record for this 152 month sequence. After peaking at 23.6% of capacity in October 2008, Lake Eildon was drawn down to 12.0% of capacity by mid-May 2009.

The contribution from the unregulated catchment between Eildon and Goulburn Weir for 2008–09 was only 18% of average. There were no periods of unregulated flow downstream of Goulburn Weir during the year.

The total transfer from the Goulburn Valley Account (GVA) to the River Murray was 15.3 GL comprising 2.8 GL via the Campaspe River and 12.5 GL via Broken Creek. Due to significant volumes of back-trade, there was no GVA water delivered at McCoy’s bridge on the lower Goulburn River. A loss allowance of 450 ML was recorded against the Murray Flora and Fauna account for GVA water delivered via the Campaspe River.

In addition to the GVA water supplied to the River Murray via the Broken Creek there was 2.8 GL and 7.7 GL delivered respectively from the Goulburn water quality allowance and Goulburn/Snowy account. There was also 772 ML of Broken/Snowy water transferred from Lake Mokoan to the River Murray.

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The contribution from the unregulated catchment between Eildon and Goulburn Weir for 2008–09 was only 18% of average. There were no periods of unregulated flow downstream of Goulburn Weir during the year.

The total transfer from the Goulburn Valley Account (GVA) to the River Murray was 15.3 GL comprising 2.8 GL via the Campaspe River and 12.5 GL via Broken Creek. Due to significant volumes of back-trade, there was no GVA water delivered at McCoy’s bridge on the lower Goulburn River. A loss allowance of 450 ML was recorded against the Murray Flora and Fauna account for GVA water delivered via the Campaspe River.

In addition to the GVA water supplied to the River Murray via the Broken Creek there was 2.8 GL and 7.7 GL delivered respectively from the Goulburn water quality allowance and Goulburn/Snowy account. There was also 772 ML of Broken/Snowy water transferred from Lake Mokoan to the River Murray.
No allocation was announced for the Loddon system and qualification of rights was declared by the Minister for Water to meet essential human and environmental needs only. There was no supplement made available to the Boort Irrigation Area.

The total volume supplied to the Wimmera-Mallee system for the year ending 30 June 2009 was 9.7 GL including supplies from the Waranga Western Channel and to Quambatook via the Normanville Pipeline.

A total volume of 540 ML was transferred from the Murray BE (Flora and Fauna) account for wetlands on the Goulburn system. Little Lake Boort was supplied with 500 ML of environmental water originally planned for in-stream use downstream of Loddon Weir by the North Central Catchment Management Authority.

Cap Compliance

Diversion from the Goulburn/Broken/Loddon valley was 639 GL, which almost equalled the Cap target of 638 GL (with preliminary adjustment for trade, environmental releases and inter-valley transfers). Diversions were 69% below the long-term Cap of 2,034 GL/year. The cumulative Cap credit to June 2009 is 180 GL. This implies that diversions since 1997 have been 1.1% below Cap. These results are summarised in Table 8.

Murray/Kiewa/Ovens

Resource availability

Natural inflows to Dartmouth and Hume reservoirs were 35% and 36% of the annual average respectively. Lake Dartmouth reached 22.8% of capacity in late December 2008 and at the end of June 2009 the reservoir was 21.4% full. Lake Hume was 35.2% in early October 2008 and by late April 2009 the storage had been drawn down to 2.1% of capacity.

Lake Victoria reached only 53.0% in early January 2009 and during May 2009 had been drawn down to as low as 20.8% of capacity. Inflows to the Menindee Lakes were very low where the maximum volume held was 541.3 GL (31.3% full) on 2 July 2008 and by late February 2009 the combined volume in storage was only 106.2 GL (6.1% full). As the Menindee Lakes did not rise above 640 GL, there was no MDBA supplement to the River Murray in accordance with operating protocols.

The opening allocation on the Murray system was 0% of HRWS and increased to 6% on 15 September 2008. There were small incremental allocation increases thereafter until the final allocation of 35% of HRWS was announced on 1 April 2009. The final Murray allocation was the lowest on record, previous lowest being 43% in 2007-08. This is the third year in a row when the final allocation has been less than 100% HRWS.

During the year, the total volume supplied from the River Murray to the Northern Mallee Pipeline was 2.5 GL.

In total, 9.0 GL of water from the Murray Bulk Entitlement (BE—Flora and Fauna account) was supplied to Gunbower Forest, Hattah Lakes, Cardross Lakes and Lower Murray River Red Gum forests. A further 6.1 GL comprising 3 GL of TLM and 3.1 GL of Commonwealth water was supplied to the Lower Murray River Red Gum forests. The Snowy River Murray Increased Flow (RMIF) account was used to deliver 300 ML to the Barmah Forest. There was also a donation of 16 ML for Hattah Lakes watering.

At 30 June 2009 there was 5.4 GL of carryover in the Murray BE (Flora and Fauna) account before the application of the 5% loss allowance and 200 ML remaining in the Snowy RMIF account.

Cap Compliance

Diversion from the Goulburn/Broken/Loddon valley was 639 GL, which almost equalled the Cap target of 638 GL (with preliminary adjustment for trade, environmental releases and inter-valley transfers). Diversions were 69% below the long-term Cap of 2,034 GL/year. The cumulative Cap credit to June 2009 is 180 GL. This implies that diversions since 1997 have been 1.1% below Cap. These results are summarised in Table 8.

Campaspe

Resource availability

Inflow to Lake Eppalock excluding the Coliban system was only 7% of average. The storage held 6.5% of capacity at the start of the year and reached a maximum of 7.0% in mid-September 2008. There was a total of 6.5 GL supplied from the Goulburn system to Lake Eppalock and a further 19 GL supplied from the Goulburn system to Sandhurst reservoir at Bendigo via the Goldfields Superpipe. Only 1.7 GL was pumped from Eppalock to Bendigo during the year.

The total volume supplied to Coliban Water and Central Highland Water was 25.5 GL of which 9.8 GL came from the Goulburn water quality allocation with the rest purchased on the water market. There was 3.7 GL more water supplied to Coliban Water in 2008–09 compared to 2007–08. By the end of June 2009, Lake Eppalock
was only 6.0% full. Coliban Water transferred 11.4 GL from Sandhurst Reservoir to White Swan Reservoir in the Ballarat system.

Campaspe Weir was operated below full supply level to minimise evaporation loss and the loss of water due to spills. No unregulated flows passed 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, tied to natural flows was effectively zero for most of the year.

As has been the practice in recent years, Goulburn-Murray Water commenced transferring Goulburn Valley Account (GVA) water to the River Murray via the Waranga Western Channel and the lower Campaspe River to maintain environmental values in the lower Campaspe River.

This GVA transfer occurred over the period 31 October 2008 to 17 May 2009 (both inclusive) at rates varying from 10 ML/day to 100 ML/day as specified by the North Central CMA. The total GVA water transferred to the River Murray via the lower Campaspe River was 2.8 GL. The provision of this transfer required an allowance of 450 ML to be debited against the Flora and Fauna account which required a transfer from the River Murray.

**Cap Compliance**

Diversions from the Campaspe valley was 28 GL, which is 15 GL below the Cap target of 43 GL. Diversions were 77% below the long-term Cap of 122 GL/year. The cumulative Cap credit since July 1997 for the Campaspe valley is 121 GL. This implies that diversions since 1997 have been 13.8% below Cap. These results are summarised in Table 8.

As proposed during last IAG audit, Victoria improved the loss function in the Campaspe Cap model to ensure that it operates satisfactorily for a wider range of hydrological conditions including the recent severe drought. This produced significantly lower Cap targets for the Campaspe valley in 1997–98, 2004–05 and 2005–06, years when the change reduced the modelled seasonal allocation. This caused the cumulative Cap credit to June 2008 to reduce by 30 GL. A report documenting the changes and seeking formal approval has been submitted to the Murray Darling Basin Authority.

**Wimmera-Mallee**

**Resource availability**

The 2008–09 season was dominated by below average inflows, resulting in a continued need to restrict supplies. This was the twelfth consecutive year of below average inflows to the system. Storages remained low with five remaining empty and others at very low levels. The maximum storage volume for the system was 6.5% in September 2008 and the minimum 3.6% in mid-May 2009. For the purposes of the Murray-Darling Basin cap reporting, diversions for the year July 2008 to June 2009 totalled 11.4 GL.


The final allocation for the 2007–08 water year (that is October 2008) was 38.2 GL. There was only sufficient available water to conduct two partial winter channel runs to directly supply towns. These channel runs secured towns in the summer channel run area and towns in the winter channel run area not secured by the Wimmera-Mallee Pipeline (WMP). All rural customers were provided access to water under an emergency water carting program from town storages and urban supplies. All customers were on stage 4 restrictions for the duration of the 2007–08 water year.

Final Supply by Agreement (SBA) allocations for 2007–08 were 31.2% for channel customers and 7.0% for headworks customers.

The environment received no allocation under its Wimmera-Glenelg Bulk Entitlement during 2007–08 due to changed sharing arrangements enforced under a Qualification of Rights. However, carryover water was available where just 8 ML was delivered to the Mackenzie River as an environmental release during 2007–08.


The total Bulk Entitlement allocation at the start of November 2008 was 25.6 GL. The Wimmera-Glenelg BE was amended in January 2009 to reflect partial reallocation of WMP water savings. Under this amended BE, an available water volume of 174.6 GL is required before all entitlements defined within the BE are met in full. Previously, this figure was 208.5 GL.

Relatively good rainfall during early winter allowed allocations to increase to 49.0 GL in August 2009. With good progress on construction of the WMP these volumes are sufficient for a restricted supply
over the 2008–09 period and will meet demands for the following twelve months. The majority of customers have been on stage 4 restrictions for the 2008–09 water year to date. The exception to this has been the easing of restrictions to stage 3 for customers supplied from the Murray River, effective from 10 February 2009. GWMW manages these customers through its Murray BE.

Customers accessing water through SBAs are restricted to 46.2% [supplied off headworks] or 64.8% [supplied by channel] of their licensed volume as of August 2009. Note these available volumes include a proportion of a high security pipeline product that has been realised through implementation of WMP savings. There was no supply to irrigation customers as of August 2009.

During 2008–09, 0.5 GL was released to the mid Mackenzie River and 0.9 GL was released to the Glenelg River for environmental purposes. Passing flows to the environment (Wimmera and Glenelg Rivers) commenced in August 2009 under the amended Wimmera-Glenelg BE. These passing flows were established as a means of returning water to the environment from WMPP savings.

**Cap Compliance**

Diversions from the Wimmera-Mallee valley was 11.4 GL in 2008–09. GWMW has developed a Cap model for the Wimmera-Mallee system and documentation of model assumptions, final model and calibration results have been submitted to MDBA for accreditation. Based on results from this model, the 2008–09 Cap target is 31 GL and the long-term average Cap is 159 GL/year.

Diversions for 2008–09 were 93% below the long-term Cap of 159 GL/year. Usage has remained within Cap, as there have been significant water savings since 1993 due to construction of the Wimmera-Mallee and Northern Mallee pipelines. The cumulative Cap credit over the period from July 1997 to June 2009 is 116 GL. These results are summarised in Table 8.

### 4.2.3 Administration of the Cap

Between 1995 and 1997 Victoria introduced and refined the following changes to water management in response to the Murray Darling Basin Ministerial Council decision to cap water use:

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

Monitoring of the effectiveness of the water management policies is undertaken on an ongoing basis. No new capping policies were introduced in 2008–09 and none are proposed for 2009–10 as these measures have continued to be effective. There is no evidence of growth in diversions in any of the Victorian valleys.

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

**Bulk Entitlements**

Victoria continued to implement the Cap on regulated systems by establishing Bulk Entitlements in accordance with the Water Act 1989. Bulk Entitlements being developed for the Victorian portion of the Murray-Darling Basin are as follows:

- Birch Creek – Will be completed by end of October 2009; and
- Snowy Environmental Reserve—An environmental entitlement for the Snowy Environmental Reserve was granted in June 2004. To date 7.7 GL of high reliability savings has been transferred from the Murray and 14.8 GL from the Goulburn. The volume of environmental entitlements in these Bulk Entitlements will be increased as other water savings projects are undertaken.

- The Living Murray – Water recovered under the Living Murray initiative has been converted into environmental entitlements in the Murray, Goulburn, Campaspe and Broken Creek systems. To date the following entitlements have been created:
  - Murray – 5.7 GL High Reliability and 98.8 GL Low reliability
  - Broken Creek – 3.0 GL Low reliability
  - Goulburn – 19.2 GL High Reliability and 141.2 GL Low reliability
  - Campaspe – 126 ML High Reliability and 5.1 GL Low reliability

**Stream Flow Management Plans**

The Victorian Government’s Our Water Our Future set the strategic direction for where Stream Flow Management Plans are required to improve environmental flows through the reduction of summer low flow stress. SFMPs set out clear objectives and actions for achieving sustainable environmental water reserves.
In many cases this will be through investing with farmers in offset measures to achieve increased environmental flows eg building off-stream winter-fill dams. Plans will also clarify levels of reliability of supply for water users and include rules for rostering, trading and the granting of any new licences. Each SFMP is developed on behalf of the Minister for Water by a consultative committee consisting of water users, community, environmental and government agency representatives and in accordance with Water Act 1989 provisions.

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

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

Through the development of the Northern Sustainable Water Strategy, the priority rivers for SFMPs in northern Victoria were reassessed. The integrated surface water and groundwater management plan for the Upper Ovens Rivers is currently underway. Management plans were proposed for the Yea River and King Parrot Creek. Unfortunately, due to the February 2009 bushfires, the hydrology, ecology and communities of these catchments were significantly affected. Therefore management plans are not proposed for these catchments at this time.

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.

Irrigation Farm Dams

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

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

Northern Victoria Irrigation Renewal Project (NVIRP)

Victoria is focussed on improving the efficiency of irrigation delivery systems from about 70 per cent to 85 per cent. 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 with the community in northern Victoria and make recommendations on 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 (NVIRP), 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 the full 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/annum over the long-term.

The Commonwealth Government has given in-principle agreement to fund up to $1 billion for Stage 2 of the NVIRP, 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 2009–10 include a Cap model for the Wimmera-Mallee valley expected to gain Authority’s approval by June 2010.

In addition, Victoria will be applying its previously announced reform program. In June 2004, the Victorian Government released a White Paper, ‘Securing Our Water Future Together’, which outlines a comprehensive, integrated approach to managing Victoria’s water resources over the next 50 years. The initiatives in the White Paper reinforce the Victoria’s commitment to working with the MDBA and other Basin states to implement the Basin Cap and The Living Murray initiative.

A paper describing how Victoria proposes to adjust the Cap for environmental flows was submitted to the Murray Darling Basin Authority in August 2009 for approval. This is a requirement of the protocol “Adjusting Caps on Diversions for Environmental Entitlements and Uses” created under Schedule E of the Murray-Darling Basin Agreement.

Adjustments to the Cap will be required to account for water recovered for the environment through irrigation modernisation projects, water purchases and other initiatives such as:

- decommissioning Lake Mokoan;
- water recovered for increased Snowy environmental flows; and
- water recovered for The Living Murray initiative.

**4.2.4 IAG Assessment**

Diversions for the Goulburn/Broken/Loddon, Campaspe and Wimmera-Mallee valleys were all at or below Cap for the year. For the Murray/Kiewa/Ovens valley, diversions were marginally above Cap for the year, although below the long-term Cap. There is no requirement for a Special Audit for this valley as the valley has a substantial cumulative credit since 1997–98.

Improvements in the Campaspe model to take account of improved transmission loss data has resulted in the reduction in the cumulative Cap credits to June 2008 by 30 GL. Revised model input data for the Goulburn/Broken/Loddon valley has also resulted in a slight adjustment to the Cap credit. Improvements have also been made to the Murray Cap model and these revised results have been used in the 2008–09 audit. In accordance with previous decisions by the IAG, the audit report from 2008–09 has incorporated these revised Cap figures although some models have yet to be fully accredited. In the interest of providing up to date estimates, particularly at this time of unprecedented drought conditions, the IAG requires and will report against revised models which have used more up to date information or have been recalibrated to account for the current drought conditions.

A plot of the historical Cap and performance against the Cap on a valley by valley basis is provided in Chapter 5 of this report. The IAG makes recommendations on compliance with the Cap based on the cumulative performance up to the latest year and will not retrospectively assess compliance in past years.

As part of the 2008–09 review, Victoria has sought advice from the IAG on the Cap accounting treatment of water diverted from the Basin as part of the Dairy Wash Licence Transition Program and Riparian Crown Frontage Fencing Program.

The objectives of these programs are to licence water already used in Victoria. To undertake them, licensing authorities (primarily Goulburn-Murray Water in northern Victoria) will need to issue new entitlements.

It is argued by Victoria that the issuing of a formal entitlement under these programs would not breach the Cap. This is because the use under the new licence regime would be no more than 1993–94 levels of use as watering of stock at the waterway has been a common practice since settlement and the watering of dairy sheds has occurred for many decades in northern Victoria. It is also argued that actual water use is likely to be lower than that at 1993–94 as the number of dairy farms in northern Victoria has declined by 30 per cent to about 2300. This has been a result of structural adjustment in the dairy industry and ongoing dry conditions. Dairy cattle numbers have also declined.

**Dairy Wash Licence Transition Program**

Victoria advises that historically, entitlements for dairy shed water were issued for nominal amounts. Dairy farms were allocated between 2 and 4 ML/year regardless of their farm size or dairy shed water needs. Research by the dairy industry and the Department of Primary Industries (DPI) and information from water corporations has confirmed that modern dairy farms use significantly more water than the nominal amount historically issued.
While new dairy-use licences are now issued on a more realistic basis, there are many dairies with historical low volume licences. The Victorian Government’s white paper Our Water Our Future, released in 2004, identified this issue and committed to implement a program to transition to full compliance. The Dairy Shed Water Licence Transition Program has been developed in response.

The program only applies to dairy farmers using water from unregulated surface water systems (and groundwater). Dairy farms on regulated systems are excluded because dairy use was addressed when licences were converted to water shares. The program will allow dairy farmers with a licence for a nominal volume to renew their licence such that it reflects actual use. It will also allow those dairy farmers who currently rely on their domestic and stock Water Act 1989 section 8 rights for dairy shed use but are in fact unauthorised users to obtain a licence. To allow a transition to the new arrangements an amnesty has been established for unlicensed dairy farmers. Farmers will be able to apply to the relevant water corporation for an increase in the volume on an existing licence, or a new licence, before the amnesty ends on 26 February 2010.

In line with Victorian policy, meters will be required for existing surface water licences of 10 ML or more and groundwater licences of 20 ML or more. New licences issued to those who have relied on their domestic and stock right must be metered.

**Riparian Crown Frontage Program**

If Victorian landholders water their stock directly from the stream, this occurs under section 8 of the Water Act 1989, which does not require a water licence and can occur free of charge. This right can only be exercised if the landholder has legitimate access to the stream, i.e. by holding a Land Act licence known as a Crown Frontage Grazing licence.

However, if the frontage is fenced, and the landholder’s stock can no longer access the waterway, under the Water Act 1989 the landholder would have to take out a section 51 water licence to divert water from the waterway to the property. In capped systems, landholders would be required to buy water on the market; even though the amount of water diverted would not change, just the method of taking it.

Victoria notes that fencing is an essential part of the riparian improvement program; a key element of protecting and improving the health of Victoria’s rivers and wetlands. The need to obtain a section 51 water licence (and specifically purchase a water entitlement in capped systems) is a major disincentive for landholders to voluntarily fence off the waterway and preventing stock access to the water’s edge.

Thus, to assist in promoting the riparian fencing, Victoria has authorised rural water corporations, acting as the licensing authority to issue a section 51 water licence to landholders if the frontage is fenced off and they maintain stewardship of the riparian frontage. The volume of this licence reflects existing levels of diversion. These licences will not be tradable. This enables water licences to be issued in capped systems without purchase of water on the market, recognising that this program does not change the amount of water taken from the waterway but the method of extraction does.

The Crown Frontage Fencing Program will be implemented within both regulated and unregulated systems across the northern Victoria.

The IAG notes that these two programs allow new water licences to be issued within Victoria’s capped systems without the purchase of water on the market. They represent exceptions to the current Cap arrangements and can be conceived as possible increases in the Cap. Victoria advised that it is expected that it will take until the end of 2011 to identify the volumes of water involved in these two programs, however estimates will be provided to the IAG in 2010. It is anticipated that the volumes of water associated with these programs will be in the order of 1 to 2 percent of Victoria’s current Cap on diversions. As usage data associated with these licences is collected it will be incorporated into the annual Cap compliance report process.

The IAG notes that water now proposed to be identified and licensed has in fact been extracted from the Basin since prior to 1993–94. The two programs will effectively rectify this data capture and licensing omission and regulate all future off takes for these purposes. Furthermore, the licences issued will be non-tradable and attached for a particular purpose to the land involved.

The IAG supports the implementation of the Dairy Shed Water Licence Transition Program and Crown Frontage Riparian Programs as being consistent with the Murray-Darling Basin Cap on surface water diversions.
4.2.5 Conclusions/Recommendations

- Diversions in 2008–09 were 1,541 GL compared to diversions of 1,556 GL in 2007–08;
- Diversions for the Campaspe, Goulburn/Broken/Loddon and Wimmera-Mallee valleys in 2008–09 were below annual climate, environmental use and trade-adjusted Cap targets;
- Diversions for the Murray/Kiewa/Ovens valley were slightly above the annual Cap targets for the year;
- Cumulative diversions since 1997 for all valleys are in credit;
- The Murray, Campaspe and Goulburn/Broken/Loddon models have been updated or subjected to some modification during the year which has resulted in a slight reduction in the Cap for each of these valleys;
- All water used by Bendigo via the Goldfields Superpipe and all water transferred to Ballarat via the Superpipe has been treated as a Campaspe diversion as previously recommended by the IAG;
- The IAG supports the Victorian proposal to issue licences under the Cap as part of its Dairy Shed Water Licence Transition Program and Crown Frontage Riparian programs;
- The IAG supports the adoption of accounting procedures under Schedule E that will provide for a full and transparent accounting of water allocated from the Cap to environmental uses such as TLM.

Accounting for Environmental Water

Victoria, of its own volition, has initiated a proposal before the Authority for Cap adjustment for environmental flows. The need for such an agreed mechanism under Schedule E is to properly account for the LTCE values of water transferred under environmental licences to purposes such as the watering of TLM Icon Sites. The IAG fully supports discussion and resolution of a process which can be applied across the Basin for water which has been specifically designated for environmental use under programs such as the TLM. Such adjustments need to be clearly reported and it is the IAG’s intention to show these adjustments separately in future years’ IAG reports once the appropriate procedures are agreed.

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

The IAG acknowledges the timely receipt of information from Victoria and the full coverage of relevant issues in the submission provided.
4.3 New South Wales

4.3.1 The Cap

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

On 1 July 2004, Water Sharing Plans commenced in most of the major regulated valleys in NSW, including the NSW Murray and Lower Darling, Murrumbidgee, Lachlan, Macquarie, Namoi, and Gwydir valleys. Each of the Plans sets in place a long-term diversion limit below Cap and provides for a range of environmentally focused water management rules. However, continuation of severe drought conditions, particularly in the southern valleys, has resulted in the suspension of these 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 NSW using valley-scale hydrologic models developed using the IQQM (Integrated Quantity-Quality Model) software developed by the NSW government. Hydrologic models have been developed using IQQM for all major regulated river systems within the NSW portion of the Murray-Darling Basin, with the exception of the NSW Murray and the Lower Darling valleys, which are modelled by the MDBA using the Murray Simulation Model (MSM).

The status of the various models used for annual Cap auditing in NSW is given in Table 9 below.

4.3.2 2008–09 Usage

For New South Wales, the continuation of drought conditions has impacted on availability of water from consumptive diversion and thus the performance of individual valleys against the valley Cap. Of particular note this year are:

- Water Sharing Plans for the NSW 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.
- Changed Cap Targets for the NSW Murray and Lower Darling, following use of modelled tributary inflows from upstream Cap models, rather than observed inflows and the adjustments to Snowy and Hume Dam inflows. Some of these changes are not accredited and the MDBA has undertaken to provide a report on the proposed changes as soon as practicable. This results in NSW Murray Cap Targets increasing by 150 GL.
- The Cap model of the Lower Darling now includes a restriction policy which has reduced Lower Darling Cap targets in recent years.
- The combined Barwon-Darling and Lower Darling Valley has exceeded the trigger for Special Auditing.

Table 10 provides a summary of NSW diversions by river valleys. This table provides diversions, Cap targets and trade adjustment for 2008–09 along with accumulated credit or debit and identifies those valleys where accumulated debits have exceeded the Schedule E trigger. Some amendments have been made to the Cap targets and accumulated credits or debits from previous years based on refinements and recalculations of the models.

Table 9: NSW Cap Auditing Models Status

<table>
<thead>
<tr>
<th>Valley</th>
<th>Auditing Tool</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murray / Lower Darling</td>
<td>Murray Monthly Simulation Model (Final)</td>
<td>Approved for use under Schedule E / To Be Reviewed</td>
</tr>
<tr>
<td>Murrumbidgee</td>
<td>IQQM (Final)</td>
<td>Submitted for accreditation</td>
</tr>
<tr>
<td>Lachlan</td>
<td>IQQM (Final)</td>
<td>Approved for use under Schedule E</td>
</tr>
<tr>
<td>Macquarie</td>
<td>IQQM (Final)</td>
<td>Reviewed for accreditation – report to be updated</td>
</tr>
<tr>
<td>Peel</td>
<td>IQQM (Final)</td>
<td>Approved for use under Schedule E</td>
</tr>
<tr>
<td>Namoi</td>
<td>IQQM (Final)</td>
<td>Approved for use under Schedule E</td>
</tr>
<tr>
<td>Gwydir</td>
<td>IQQM (Final)</td>
<td>Approved for use under Schedule E</td>
</tr>
<tr>
<td>Border Rivers</td>
<td>IQQM (Interim)</td>
<td>Model being prepared for submission</td>
</tr>
<tr>
<td>Barwon-Darling</td>
<td>IQQM (Final)</td>
<td>Preliminary results available</td>
</tr>
</tbody>
</table>
assigned limited volumes of water direct to priority users, initially on a month-by-month basis, in accordance with an assessment of individual needs for that month.

Some improvement in water availability did occur during the water year, leading to a 95% allocation for towns, domestic and stock users by mid-October 2008, as well as 95% allocation for high security. General security allocations reached a maximum of 9% in January 2009. In addition, water carried over to 2008–09 was made available representing 10% of general security.

Two replenishment flows, one in Spring the next in Summer, were provided for the environmentally sensitive Wakool system.

Cap compliance
Cap compliance for the regulated sections of the Murray Valley has been assessed using the Murray Simulation Model (MSM) that has been accredited for use. Cap modelling excludes all Snowy borrows which has the effect of reducing the current Cap credits. For the first time, the Murray Cap modelling has used the modelled outflows from upstream valleys under Cap conditions, rather than observed outflows from these valleys (this was incorrectly reported as being the case last year).

### Table 10: NSW Annual Cap Accounting 2008–09

<table>
<thead>
<tr>
<th>System</th>
<th>Long-term Diversion Cap</th>
<th>2008-09 Cap Target</th>
<th>Net trade from valley</th>
<th>Environ. Water Use adjustment</th>
<th>2008-09 diversion</th>
<th>Cumulative since 1/7/97</th>
<th>20% schedule trigger</th>
<th>Trigger Exceeded</th>
<th>Storage Difference (Model-Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barwon-Darling</td>
<td>172</td>
<td>142</td>
<td>0</td>
<td>11</td>
<td>149</td>
<td>-19</td>
<td>-9</td>
<td>Yes</td>
<td>0</td>
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<tr>
<td>Lower Darling</td>
<td>137</td>
<td>53</td>
<td>27</td>
<td>0</td>
<td>9</td>
<td>16</td>
<td>161</td>
<td>-24</td>
<td>No</td>
</tr>
<tr>
<td>Combined Barwon-Darling &amp; Lower Darling</td>
<td>309</td>
<td>195</td>
<td>27</td>
<td>11</td>
<td>159</td>
<td>-2</td>
<td>-186</td>
<td>Yes</td>
<td>40</td>
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<tr>
<td>Intersecting Streams</td>
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<td>0</td>
<td>0</td>
<td>3</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>Border Rivers</td>
<td>n/a</td>
<td>n/a</td>
<td>8</td>
<td>0</td>
<td>138</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>Gwydir</td>
<td>344</td>
<td>196</td>
<td>0</td>
<td>0</td>
<td>154</td>
<td>43</td>
<td>159</td>
<td>-69</td>
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<td>Namoi/Peel</td>
<td>338</td>
<td>245</td>
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<td>0</td>
<td>188</td>
<td>57</td>
<td>153</td>
<td>-68</td>
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<td>Macquarie/ Castlereagh/Bogan</td>
<td>468</td>
<td>143</td>
<td>0</td>
<td>0</td>
<td>104</td>
<td>39</td>
<td>335</td>
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<td>Lachlan</td>
<td>334</td>
<td>59</td>
<td>0</td>
<td>0</td>
<td>40</td>
<td>19</td>
<td>134</td>
<td>-62</td>
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<tr>
<td>Murrumbidgee</td>
<td>2,358</td>
<td>1,045</td>
<td>390</td>
<td>6</td>
<td>602</td>
<td>47</td>
<td>1,427</td>
<td>-472</td>
<td>No</td>
</tr>
<tr>
<td>NSW Murray</td>
<td>1,880</td>
<td>495</td>
<td>138</td>
<td>4</td>
<td>341</td>
<td>13</td>
<td>145</td>
<td>-376</td>
<td>No</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6,033</td>
<td>2,379</td>
<td>563</td>
<td>21</td>
<td>1,729</td>
<td>216</td>
<td>2,168</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• All volumes are shown in gigalitres (GL); n/a indicates estimate is not available.
• All diversions and targets include estimates of unregulated stream diversions.
• 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 NSW Murray Valley includes cumulative permanent trades to other States since 1/7/1997.

### Murray Valley

#### Resource availability

Water availability in 2008–09 remained at critically low levels throughout the year. Monthly inflows tracked below those of the previous year for each month apart from September and October which were only slightly better. The water sharing plan for the NSW Murray Regulated Water Source remained suspended throughout the year.

Record low winter rainfall was recorded in parts of the Riverina; for example Mulwala Post Office recorded 22.9 mm from an average 104.2 mm and Wakool (Barratta) just 9.4 mm from an average of 104.2 mm. Rainfall in Spring improved to be typically 70–85% of average but remained below average across Summer and Autumn, apart from December, where above average rainfall was received generally across the south and south west of the State.

The cumulative impact of low rainfall over six previous years kept flows at critically low levels during 2008–09. Towns, domestic and stock users, high employment industries and permanent plantings were allocated restricted volumes of water to ensure critical needs were met and permanent plantings survived. The Critical Survival Water Program
Schedule E accounting for the 1997–98 to 2008–09 water years indicates that the NSW Murray Valley is cumulatively 145 GL below Cap which is slightly lower than reported last year but is yet to include the effect of drought management rules within the Cap model. Observed storage levels at 30 June 2009 were 234 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 234 GL of Cap debits would be generated.

The cumulative credit of 145 GL implies that diversions from July 1997 have been 0.9% below Cap.

**Murrumbidgee Valley**

**Resource availability**

Water availability in 2008–09 continued at critically low levels as the drought persisted throughout the year. Rainfall was below average for most of the year with winter well below average. Hay recorded just 11.7 mm from a winter average 96.5 mm. Autumn was dry also with the Murray-Darling Basin-wide average measuring 83 mm compared with an historical 125 mm. The cumulative impact of low rainfall over the six previous years meant that below average rainfall produced only minor streamflows during 2008–09.

The Water Sharing Plan remained suspended for the year, with environmental accounts under the Plan also suspended, along with "translucent" and "transparent" releases from Burrinjuck and Blowering Dams. Unregulated tributary inflows were used where possible to meet critical environmental requirements.

To provide towns, stock and domestic users, high employment industries and permanent plantings with restricted volumes of water, a Critical Survival Water Program was implemented. The Critical Survival Water Program provided limited volumes of water direct to these specific water users, initially on a month-by-month basis, based on an assessment of individual requirements for that month.

However, with improvements during the water year, 95% allocations to towns, stock and domestic users and high security irrigation were able to be made by mid-October 2008 and access to all previously suspended account water could be restored. Water availability for general security licensees increased to 21% by mid-January 2009 plus water carried over to 2008–09 (equivalent to 13% of general security entitlement). The regulated Water Sharing Plan remained suspended during 2008–09.

**Cap compliance**

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

Schedule E accounting for the 1997–98 to 2008–09 seasons indicates that the total Murrumbidgee Valley is cumulatively 1,427 GL below Cap. Despite recalibration of losses in the Murrumbidgee IQQM over recent years, high river transmission losses observed in recent years continue to be underestimated by the model which has an effect of increasing Cap credits. Results presented here are yet to include the effect of including representation of drought management rules within the Cap model. Observed storage levels at 30 June 2009 were 830 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 830 GL of Cap debits would be generated.

The cumulative credit of 1,427 GL implies that the Murrumbidgee Valley has been 6.2% below Cap since July 1997.

**Lachlan Valley**

**Resource availability**

The Lachlan Valley continued to suffer significantly under drought conditions throughout 2008–09. Six years of critically low inflows has meant almost continuous drought contingency planning during this period with severe water sharing provisions continuing between towns, high security and stock and domestic users. Towns received an allocation of 70%, stock and domestic users 50% and high security users 30%. Carryover of account water into 2008–09 equated to about 1% of general security entitlement.

Periodic rainfall in Spring and Summer was insufficient to improve stream flows and the unprecedented sequence of low inflows has continued. Inflows since 2002–03 have been at record lows, being cumulatively below the previous six year minimum inflow sequence, as well as setting record minimums for shorter periods (three –five years).

The Water Sharing Plan has been suspended since commencement in July 2004. Also, provisions to address the severe water shortage have continued including the suspension of the rules relating to the environmental "translucent" releases (a proportion of inflows to Wyangala dam), reduced end of system flow requirements and specifically targeted water sharing arrangements between high security water users based on critical water requirements.
Cap compliance

The Lachlan IQQM Cap model 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 2008–09 seasons indicates that the Lachlan Valley is cumulatively 134 GL below Cap although the Cap model does not include representation of drought management rules. Observed storage levels at 30 June 2009 were 75 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 75 GL of Cap debits would be generated.

The cumulative Cap credit of 134 GL implies that the Lachlan Valley has been 5% below Cap since July 1997.

Macquarie Valley

Resource availability

There was sufficient resource available at the start of the 2008–09 water year to announce full allocations for towns, stock and domestic users and high security water users in the Macquarie and Cudgegong regulated river water sources. Incremental announcements for general security licence holders between November 2008 and March 2009 saw their allocations rise to a maximum 10%. Carryover into 2008–09 was equivalent to 7% of general security entitlements in the Macquarie Valley and 50% of general security entitlements in the Cudgegong Valley.

Average Winter rainfall improved to above average in Spring across most of the north of the State providing better resource availability than in previous years. Rain was close to average over Summer and Autumn, except for some storms in the north in late summer which provided some heavy rains, including at Bourke which had its wettest day on record – 198 mm on 14 February.

Due to insufficient improvement in resource availability the Water Sharing Plan remained suspended throughout 2008–09.

Cap compliance

The Cap for the regulated sections of the Macquarie Valley has been audited using the Macquarie Valley IQQM that has been submitted for audit and accreditation. Recent changes to this model and its input data have resulted in the cumulative Cap targets for 1997 to 2008 being 3% higher than the cumulative targets for these years calculated last year.

Schedule E accounting for the 1997–98 to 2008–09 seasons indicates that the Macquarie Valley is cumulatively 335 GL below Cap although the Cap model does not include drought management rules. Observed storage levels at 30 June 2009 were 169 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 169 GL of Cap debits would be generated.

The cumulative Cap credit of 335 GL implies that the Macquarie Valley has been 8.1% below Cap since July 1997.

Namoi/Peel Valley

Resource availability

The Namoi Valley consists of three distinct systems: the main Lower Namoi Valley, the smaller Peel River system and Manilla River/Upper Namoi system. A return to near average rainfall conditions ensured sufficient water to announce full allocations for towns, domestic and stock and high security licence holders from the start of the season. In the upper Namoi, general security allocations reached 50% while in the lower Namoi they rose incrementally between October 2008 and March 2009, reaching 24%.

Near average rainfall conditions were experienced overall but this included some periodic heavy rainfall in Spring and Summer and isolated flooding. Chaffey Dam remained full for the year; Keepit peaked at about 40% in summer before receding to 35% while the Split Rock Dam remained low, falling from 6% to 4%.

The Namoi Valley commenced 2008–09 with carryover equivalent to 12% of general security entitlement.

Cap compliance

The Namoi 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. The Peel IQQM Cap model has also been accredited by the Murray-Darling Basin Authority for use under Schedule E of the M-DB Agreement. Diversions for the combined valleys are below annual Cap targets since 1997–98 by a cumulative total of 153 GL.

Observed storage levels at 30 June 2009 were 66 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 66 GL of Cap debits would be generated.

As was the case last year, the approved Cap model has been provisionally adjusted to include the effect of restricted access during some unregulated events during 2006–07 and 2007–08. These restrictions were to ensure sufficient flows reached Menindee Lakes to provide critical water supplies to Broken Hill.
This has the effect of reducing Cap credits by 58 GL. A proposal to modify the approved Cap model to address this issue will be developed by NSW and put forward for consideration by the MDBA.

The cumulative Cap credit of 153 GL implies that the Naomi/Peel Valley has been 4.7% below Cap since July 1997.

Gwydir Valley

Resource availability

The dry climatic conditions of previous years eased somewhat in 2008–09 with the Gwydir Valley enjoying near average rainfall (above average in Spring) that spread across the northern part of the State.

Full allocations were announced on 1 July for towns, domestic and stock and high security water licence holders. General security licences received no allocation. However carryover from 2007–08 was supported in the amount of 21% of general security entitlement.

Autumn saw a return to drier conditions, recording the ninth consecutive year of below average Autumn rainfall. Copeton Dam storage dropped over Summer from 18% to 13% where it remained steady for the remainder of the year.

Temperatures were average for Winter but above average for the remainder of the year. Both Spring and Autumn recorded their ninth consecutive year of above average temperatures.

Cap compliance

The Cap for the regulated sections of the Gwydir Valley has been audited using the Gwydir IQQM approved by the Authority under Schedule E of the M-DB Agreement. Results indicate that diversions are cumulatively 159 GL below Cap since 1997–98. Observed storage levels at 30 June 2009 were 23 GL higher than those simulated under Cap conditions. If this stored water is used before the storage next spills, 23 GL of Cap debits would be generated.

This year, the approved Cap model has been provisionally adjusted to include the effect of restricted access during some unregulated events during 2006–07 and 2007–08. These restrictions were to ensure that sufficient flows reached Menindee Lakes guaranteeing critical water supplies to Broken Hill. This has the effect of reducing Cap credits by a similar amount to that assessed for the Namoi Valley.

The cumulative Cap credit of 159 GL implies that diversions from the Gwydir Valley have been 4.5% below Cap since July 1997.

NSW Border Rivers Valley

Resource availability

Following very dry conditions over preceding water years, the NSW Border Rivers commenced with a carryover volume equivalent to 24% of general security entitlement. High security, domestic and stock and town water users commenced the year with 100% allocations.

Inflows during the spring and summer period resulted in further general security allocations equivalent to 14% of entitlement.

Cap compliance

A formal Inter-Governmental Agreement (IGA) on water sharing arrangements in the Border Rivers has been signed by the NSW and QLD premiers. The IGA limits each state to the long-term diversion resulting from 2002 levels of development, with the application of environmental flow rules described in the IGA. Subject to agreement on floodplain harvesting activities this is estimated to provide an end of system flow at Mungindi of around 61% of natural flow.

The provisions of the IGA are embedded in the Water Sharing Plan for the NSW Border Rivers (and referred to in the Resource Operations Plan for Queensland) which commenced in July 2009. Modelling indicates this results in a Plan Limit (on diversions) of around 191 GL/year for the NSW Border Rivers regulated system. According to NSW this is approximately 4% below the long-term average diversions under the Cap to be proposed by NSW.

NSW and Queensland have now agreed on modelling describing state shares. NSW will now prepare a Cap model reflecting this work and the proposed allowance for the enlargement of Pindari Dam. It is expected that a Cap proposal and modelling will be finalised during 2009.

Intersecting Streams

Cap Compliance

The Warrego, Paroo, Culgoa, Narran and Moonie Rivers flow across the NSW-Queensland border and reaches of these rivers within NSW 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 there is no monitoring of usage. However, “Macro” Water Sharing Plans for unregulated areas within NSW are currently being established which will:
• Facilitate conversions of licences to the new Water Management Act 2000;
• Provide a framework for establishing Caps;
• Allow for more detailed water access rules for sub-catchments where there is significant competition for resources – either between consumptive users or users and the environment.

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

No Schedule E accounting is currently available for intersecting streams. The IAG was advised that there was some water available from these streams during 2008–09.

There are 19 GL of entitlements associated with the NSW Intersecting Streams and estimated usage of 3 GL last year is based on a survey conducted in 2000.

Barwon-Upper Darling Valley

Resource availability

Good flows in the upper reaches of the Basin coupled with flows generated from heavy rainfall in the Bourke area in February and March 2009 allowed access to significant extractions for the first time since March 2008. Further smaller flows in June provided a limited opportunity mainly for licence holders in the upper reaches. The total volume of extractions in 2008–09 was 149 GL. In addition 11 GL of environmental water supplied from the Toorale property was purchased by the Commonwealth Environmental Water Holder.

NSW has implemented a new Cap strategy similar to those applied in other unregulated streams in NSW to ensure Cap compliance in the Barwon-Darling Valley. The restructured water entitlements and access rules have operated since 2007 and will ensure that, provided the inflows do not decrease, long-term average diversions will not, in the very long-term, exceed the long-term Cap. It is acknowledged by NSW, 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 in others. The new Cap arrangements applied from 1 July 2007 and include:

• 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 representing the volume that would have been available had the licence restructure occurred in 1993–94 (170 GL),
• Unlimited carryover of allocated water from one water year to the next and the introduction of a trading framework.

NSW has commenced development of a Water Sharing Plan for the Barwon-Darling valley which will incorporate this Cap strategy to support volumetric growth, as well as event-based access rules protecting important environmental flows and downstream users. The IAG was advised that this Plan is a priority for NSW. However it is unlikely that any significant changes to current management arrangements will be made prior to the completion of the planning process. This could extend over more than one year in the context of other changes anticipated as part of development of the Water Sharing Plan.

Cap compliance

The Barwon-Darling IQQM Cap model has been calibrated and is available for long-term and annual Cap simulations to assess Cap compliance. 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 sufficient flows reach 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.

Preliminary Schedule E accounting for the 1997–98 to 2008–09 period, using observed inflows from upstream valleys, indicates that the Barwon-Darling Valley is cumulatively 347 GL above Cap and remains well above the 34 GL trigger for Special Auditing based on 20% of the estimated long-term average Cap diversion.

Whilst diversions have exceeded cumulative annual Cap Targets, NSW notes that at an average of 157 GL/year over the 1997–98 to 2008–09 period, this is below the long-term average diversion of 173 GL/year. NSW argues that new licensing arrangements commenced in 2007 will ensure future diversions also remain within the long-term Cap. However, the cumulative Cap credit of 347 GL implies the Barwon-Darling Valley has been 22% above Cap since 1997. Last year the diversion of 149 GL was 14% higher than the annual target and the limit to diversions imposed by the Barwon-Darling Capping mechanism was about 500 GL.
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Lower Darling Valley

Resource availability

Although total Menindee Lakes storage fell to critical levels there was some improvement in the Summer of 2007–08. This allowed announcement of full allocations for consumptive use for towns, domestic and stock and high security water licence holders at the commencement of 2008–09. General security carryover into 2008–09 was 58%.

Further improvement in resources from rainfall in the north of the State allowed general security allocations to be announced in October, increasing to 50% by mid-December 2008. Water supply for Broken Hill was also assured for more than 21 months.

Barwon Darling flows were sufficient to fill Lakes Tandure and Wetherell bringing total water stored in the Menindee Lakes system to about 13% (some 218 GL). Storage remains precariously low and in NSW control, being well below the 640 GL threshold beyond which control passes to the Murray Darling Basin Authority.

There was no supplementary access available during 2008–09.

Cap compliance

The Cap for regulated sections of the Murray Valley has been audited using the Murray Simulation Model (MSM). However, the independent auditor has recommended either further work be undertaken to improve the quality of the model’s calibration or required standards be reviewed. The main issue is the ability to model 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, a consistent calibration of diversions across the half dozen years of larger diversions has not been possible. Despite further work by the Authority, NSW believes there is some further work outstanding to better define 1993–94 behaviour of irrigation operations at Lake Tandou. It is intended to undertake this work shortly. The model has been modified to include a restriction policy in dry years, an improvement reducing Cap targets calculated for recent years.

Preliminary Schedule E accounting for the 1997–98 to 2008–09 period indicates that the Lower Darling Valley is cumulatively 161 GL below Cap, implying diversions have been 15% below Cap since July 1997.

Combined Barwon/Upper Darling and Lower Darling Cap Accounting

Cap Compliance

Preliminary Schedule E accounting for the 1997–98 to 2008–09 period indicates that the cumulative actual diversions in the combined Barwon-Darling and Lower Darling Valleys are 186 GL above the cumulative annual diversions targets and also above the combined trigger for a Special Audit of 62 GL, being 20% of the average annual long-term diversion. Thus, in accordance with the provisions of Schedule E, the IAG recommends that the combined Barwon/Upper Darling and Lower Darling be subject to a Special Audit.

The IAG notes that the requirement for a Special Audit follows on from a similar requirement for the 2007–08 year (reported upon in last year’s IAG Cap report).

NSW has advised that it has implemented a management plan for this combined valley based upon an annual allocation (with carryover) of 173 GL/year regardless of climate conditions. NSW also notes that given the episodic nature of flows in this valley, an annual allocation at the annual average Cap of 173 GL will, in the long-term, result in the Cap being met. The IAG has not supported this argument, noting the long-term time frame is not clear. The combined valley has, on average, been 7% over Cap since July 1997.

Diversions in Unregulated River Systems.

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

Unmetered use estimates are taken from the volumetric conversion process (2000) based on crop areas survey and assessed irrigation requirements. Estimated average use over the years 1993–94 to 1998–99 is presented in Table 11.

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

NSW intends to cap unmetered users according to the average 1993–94 to 1998–99 diversion estimate arising from the volumetric conversion process.

Estimates of unregulated stream usage [both metered and unmetered] have been included in diversions reported in Table 11 and added to the Cap Targets generated by the models.
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;
- 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

Impacts of record low inflows to many valleys have continued this year and contingency measures to ensure water security for higher priority water users such as towns and intensive use industries remain in place.

NSW will revert to the Water Sharing Plan arrangements once the immediate drought crisis has passed.

**Table 11: Unregulated Use in NSW**

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<thead>
<tr>
<th></th>
<th>Unmetered Use</th>
<th>Metered Use</th>
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<td>Lower Darling</td>
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<td>NSW Border Rivers</td>
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<tr>
<td>Intersecting Streams</td>
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</table>

**4.3.3 Monitoring and Reporting**

NSW has now submitted models for six of its nine designated Cap valleys for audit. Four have been approved by the Authority with the remaining two in the process of being audited.

A Cap is yet to be submitted and agreed for the Border Rivers. It is expected that NSW will submit Cap details for this valley later in 2010.

The IAG notes that Water Sharing Plans in NSW have largely been suspended during this time of exceptional drought conditions. Effectively this allows NSW to take action outside of these plans to try to ensure water is available for household and livestock users, particularly in highly constrained valleys. This has been the experience in 2008-09 and until current drought conditions are broken, it is anticipated NSW will continue to use these powers.

**4.3.4 Administration of the Cap**

NSW relies primarily upon Water Sharing Plans to ensure that the Cap requirements are met. Record drought conditions, particularly in the southern NSW valleys, have again resulted in continued suspension of regulated Water Sharing Plans for the NSW Murray, Lower Darling, Murray–Darling Basin Authority

**Table 11: Unregulated Use in NSW**

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<tr>
<td>Intersecting Streams</td>
<td>3</td>
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</tbody>
</table>
4. Audit of Cap Implementation 2008–09

4.3.6 Conclusions/Recommendations

- Diversions in 2008–09 were 1,729 GL compared to 1,466 GL in 2007–08;
- Cap models have been approved for four NSW valleys and are currently being audited for two of the remaining five NSW valleys;
- Preliminary Schedule E accounting for 1997–98 to 2008–09 period indicates 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;
- Cumulative Cap credits exist for other valleys in NSW;
- The IAG has been unable to assess the Cap compliance of the NSW Border Rivers because a Cap has still not been proposed;
- Upon completion of the integrated 1993–94 and “current conditions” model for the Border Rivers, NSW should submit the proposed Cap for that system for assessment by the IAG of an appropriate allowance for the enlarged Pindari Dam;
- NSW needs to advise on timing for proposed capping of unmetered streams and proposed Cap arrangements for diversions on unregulated streams.
- As with other States/Territories, NSW needs to improve its procedures for adjusting the Cap for water transferred to environmental use either by The Living Murray or the Commonwealth Environmental Water Holder.

4.3.5 IAG Assessment

Extreme drought conditions have continued across NSW valleys in 2008–09. With the exception of the combined Barwon-Darling/Lower Darling valley all other NSW valleys are within Cap for 2008–09.

In discussions with NSW, the issue of accounting for transfer of water to environmental uses has been reviewed. NSW has made some preliminary adjustments in its reporting for 2008–09 to reflect water allocated to TLM use for example. Without commenting on the best way in which to record and account for adjustments in the LTCE of water allocated to special environmental purposes, the IAG notes that there is general acknowledgement within jurisdictions about the need for an agreed mechanism to account for these diversions. This mechanism will need to be agreed by all parties to the Cap reporting arrangements and a standard approach adopted for the 2009–10 year in anticipation of greater volumes of water being transferred in this way.

The IAG notes that the combined Barwon/Upper Darling and Lower Darling Valley has exceeded the trigger for a Special Audit. The need for appropriate mechanisms to address this continuing issue is not lessened by concerns regarding possible further changes to water sharing arrangements once the Basin Plan is agreed and the current suspension of the previously agreed Water Sharing Plans for this valley is lifted. The growth in excess of the Cap in this valley in the 2008–09 water year, notwithstanding the episodic nature of flows in this part of the Basin, serves to undermine the Cap’s effectiveness and its enforcement in the eyes of the wider community.

The IAG notes that despite having completed an IQQM model for the Border Rivers (albeit in interim form), NSW has not used results from this model to inform wider stakeholder interest groups of the performance of Border River diversions against the Cap in 2008–09. The IAG, for other valleys throughout the Basin, has taken the opportunity to use preliminary estimates of Cap, wherever these are available, to inform interested stakeholder groups of performance under the Cap regime.
4.4 Queensland

4.4.1 The Cap

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

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 will be submitted once the Resource Operations Plan (ROP) for this valley is finalised. However, finalisation of the ROP has been delayed because of legal proceedings initiated by a stakeholder in the valley. Until this matter is resolved in the courts, the ROP cannot be finalised and presented for acceptance. Queensland believes this matter should be considered by the court and a decision made during 2009–10.

Determination and calculation of Caps for the valleys in Queensland has been based on an extensive period of consultation and analysis undertaken across each valley. This has involved both the preparation of Water Resource Plans (WRP) and, under provisions of the Water Act 2000 (Qld), the development of ROPs for each valley to implement provisions of the WRPs. Diversion Caps for Queensland valleys are implemented as part of the monitoring, auditing and reporting provisions of the ROPs.

Usage in all valleys in Queensland 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 prior to March 1995 (major sections of the Lower Balonne have had administrative holds in place since October 1991 and other sections including the majority of the Border Rivers since 1992). Following introduction of the Water Act 2000 in September 2000, administrative holds were replaced by moratoriums on the issue of new licences and development of new works associated with those licences. A moratorium on taking water for other than 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 presently underway and the first full Cap audit for these valleys was undertaken for the 2006–07 water year. The IQQM model for the Border Rivers has been submitted for accreditation. This model has been used, in conjunction with the ROP, to assess Cap compliance in the Border Rivers during 2008–09. The Cap model for the Condamine and Balonne system will be submitted once the ROP for this system is finalised.

4.4.2 2008–09 Diversions

The summer period (November 2008 to March 2009) began with above-average rain falls and subsequent small flows across the Queensland section of the Murray-Darling Basin in what was a promising start to the 2008–09 season. Isolated follow-up rainfall saw some smaller flows occur through until February 2009. Widespread rainfall in May 2009 and June 2009 resulted in a relatively unusual winter flow in most major streams to finish the year off much as it started – promisingly.

Flows in the Lower Balonne were the exception for the year. Beardmore Dam overtopped in November 2007 for the first time since 2005 but in the 2008–09 year the storage again failed to fill, peaking at 78% in December 2008. However, significant stock and domestic flows (58.6 GL) were passed to downstream reaches.

Overall rainfall across the Queensland valleys was about average but falls were of uncharacteristically low intensity with only infrequent sporadic heavy events resulting in stream flow.

A feature of the 2008–09 summer was a continuity of flow occurring due to multiple rainfall events over November, December and January across the area. This pattern of continuity was essentially a repeat of the 2007–08 experience although volumes were significantly lower and not interspersed with any major events.

The continuity in the 2007–08 and 2008–09 years was a marked contrast to the pattern of the preceding few years which were characterised by enduring drought conditions and no flow for long periods in a number of instances.

Table 12 summarises the diversions from the Queensland catchments and the annual flow volumes for 2008–09 as measured at key sites. Flows were generally well below the average long-term mean figures despite near average rainfall. A lack of stream flow has resulted in well below average diversion figures.
4. Audit of Cap Implementation 2008–09

Table 12: Summary for Queensland catchments 2008–09

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<thead>
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<td>Condamine-Balonne</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condamine (Chinchilla)</td>
<td>103</td>
<td>519</td>
<td>91</td>
</tr>
<tr>
<td>Maranoa (Cashmere)</td>
<td>1</td>
<td>115</td>
<td>1.1</td>
</tr>
<tr>
<td>Balonne (St George)</td>
<td>60</td>
<td>1,004</td>
<td>66</td>
</tr>
<tr>
<td>Border</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granite Belt (Farnbro)</td>
<td>30</td>
<td>74</td>
<td>8</td>
</tr>
<tr>
<td>Macintyre/Barwon (Goondiwindi)</td>
<td>291</td>
<td>970</td>
<td>91</td>
</tr>
<tr>
<td>Weir (Talwood)</td>
<td>43</td>
<td>140</td>
<td>39</td>
</tr>
<tr>
<td>Moonie (Fenton)</td>
<td>64</td>
<td>139</td>
<td>23</td>
</tr>
<tr>
<td>Nebine (Roseleigh)</td>
<td>8</td>
<td>only recently gauged</td>
<td>1</td>
</tr>
<tr>
<td>Warrego (Cunnamulla)</td>
<td>44</td>
<td>305</td>
<td>3</td>
</tr>
<tr>
<td>Paroo (Caiwarro)</td>
<td>138</td>
<td>516</td>
<td>1</td>
</tr>
</tbody>
</table>

In-stream diversion across all valleys is estimated to be 321 GL made up of a combination of supplemented diversion (allocation take from regulated flow associated with public storages) and unsupplemented diversion (take primarily from water harvesting practices).

Overland flow, in the form of upland flow capture, on farm runoff and floodplain diversions are not included in the above figures. Where this has been assessed, either from modelling or regional appraisal in the key areas where water harvesting and floodplain diversion operate together, it is estimated that a further 38 GL of diversion has occurred.

Diversions in Queensland are highly variable owing to the ephemeral nature of flow in its streams. For example, the 2008–09 diversion contrasts distinctly from the record 876 GL diversion for 2007–08 and is more like the 2004–05 and 2005–06 water years. Table 13 shows diversions for the total Queensland valleys over the past 16 years. Diversions reflect the inherently variable nature of stream flow in the Queensland valleys.

Table 13: Queensland Basin Diversions (excluding overland flow harvesting) (GL)

<table>
<thead>
<tr>
<th>Report</th>
<th>Year</th>
<th>Diversions (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1993–94</td>
<td>336</td>
</tr>
<tr>
<td>2</td>
<td>1994–95</td>
<td>176</td>
</tr>
<tr>
<td>3</td>
<td>1995–96</td>
<td>528</td>
</tr>
<tr>
<td>4</td>
<td>1996–97</td>
<td>467</td>
</tr>
<tr>
<td>5</td>
<td>1997–98</td>
<td>741</td>
</tr>
<tr>
<td>6</td>
<td>1998–99</td>
<td>609</td>
</tr>
<tr>
<td>7</td>
<td>1999–00</td>
<td>541</td>
</tr>
<tr>
<td>8</td>
<td>2000–01</td>
<td>688</td>
</tr>
<tr>
<td>9</td>
<td>2001–02</td>
<td>341</td>
</tr>
<tr>
<td>10</td>
<td>2002–03</td>
<td>214</td>
</tr>
<tr>
<td>11</td>
<td>2003–04</td>
<td>815</td>
</tr>
<tr>
<td>12</td>
<td>2004–05</td>
<td>392</td>
</tr>
<tr>
<td>13</td>
<td>2005–06</td>
<td>306</td>
</tr>
<tr>
<td>14</td>
<td>2006–07</td>
<td>149</td>
</tr>
<tr>
<td>15</td>
<td>2007–08</td>
<td>876</td>
</tr>
<tr>
<td>16</td>
<td>2008–09</td>
<td>321</td>
</tr>
</tbody>
</table>

Water year reported prior to 2006 was 1 October to 30 September
Water year reported post 2008 is 1 July to 30 June
Diversions in the Queensland valleys are characterised by greater volumes of unsupplemented water compared to the quantity provided through water supply schemes, [see Table 14]. Overland flow take, in the form of floodplain harvesting, is based on estimates only.

Table 14. Water Diversions by Section (GL)

<table>
<thead>
<tr>
<th>Section</th>
<th>Unsupplemented</th>
<th>Supplemented</th>
<th>Overland flow</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paroo</td>
<td>198</td>
<td>123</td>
<td>38</td>
<td>359</td>
</tr>
</tbody>
</table>

As Table 15 shows, the end of system flows from Queensland valleys for the year was 391 GL, compared with more than 3,200 GL in 2007–08, highlighting the extreme variability inherent in this part of the Basin. The level of flow experienced across all valleys was well below average resulting from unusually low intensity rainfall, although recorded annual rainfall volumes were near average.

Table 15. Cross Border Flows – 2008–09 Water Year (GL)

<table>
<thead>
<tr>
<th>Valley</th>
<th>Cross Border Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paroo</td>
<td>138</td>
</tr>
<tr>
<td>Warrego</td>
<td>24</td>
</tr>
<tr>
<td>Nebine</td>
<td>8</td>
</tr>
<tr>
<td>Condamine-Balonne</td>
<td>51</td>
</tr>
<tr>
<td>Moonie</td>
<td>64</td>
</tr>
<tr>
<td>Border</td>
<td>106</td>
</tr>
<tr>
<td>TOTAL</td>
<td>391</td>
</tr>
</tbody>
</table>

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 water service provider storages also used in part to supply urban needs. Despite an unusually late, June 2009, stream flow event boosting levels in most catchments, storage volumes in the larger storages generally finished the year at comparatively low levels reflecting low average streamflows in the catchment over the 2008–09 period. Table 16 shows the level of storage as at 30 June 2009.

Table 16: Public storages across Queensland valleys

<table>
<thead>
<tr>
<th>Storage</th>
<th>Percent full at 30 June 2009</th>
<th>Full storage capacity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooby Dam</td>
<td>10.6%</td>
<td>24 GL</td>
<td>Toowoomba urban water supply</td>
</tr>
<tr>
<td>Leslie Dam</td>
<td>13.2%</td>
<td>106 GL</td>
<td>Warwick urban water supply and Upper Condamine WSS</td>
</tr>
<tr>
<td>Connolly Dam</td>
<td>71%</td>
<td>2.4 GL</td>
<td>Warwick urban water supply</td>
</tr>
<tr>
<td>Chinchilla Weir</td>
<td>74.8%</td>
<td>10 GL</td>
<td>Chinchilla urban water supply and Chinchilla WSS</td>
</tr>
<tr>
<td>Beardmore</td>
<td>53.3%</td>
<td>81 GL</td>
<td>St George WSS</td>
</tr>
<tr>
<td>Jack Taylor Weir</td>
<td>72.7%</td>
<td>10 GL</td>
<td>St George urban water supply and St George WSS</td>
</tr>
<tr>
<td>Neil Turner Weir</td>
<td>100%</td>
<td>1.5 GL</td>
<td>Maranoa WSS</td>
</tr>
<tr>
<td>Storm King Dam</td>
<td>62%</td>
<td>2.4 GL</td>
<td>Stanthorpe urban water supply</td>
</tr>
<tr>
<td>Glenlyon Dam</td>
<td>24%</td>
<td>254 GL</td>
<td>Supports NSW / Qld supplemented water system</td>
</tr>
<tr>
<td>Coolmunda Dam</td>
<td>39.7%</td>
<td>69 GL</td>
<td>Macintyre Brook WSS</td>
</tr>
<tr>
<td>Warrego</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cunnamulla Weir</td>
<td>100%</td>
<td>4.8 GL</td>
<td>Cunnamulla WSS</td>
</tr>
</tbody>
</table>

WSS refers to a supplemented water supply scheme operated by SunWater and where most of the water use is for irrigation.
The relatively reliable summer flow pattern in the Warrego River continued though volumes were significantly below average. A flow late in the year (June) provided some relief in terms of stream flow volume.

Supplemented water diversion in this valley is limited to a small water supply scheme based on a 4.8 GL weir on the Warrego River at Cunnamulla. The announced allocation for the year was again 100 per cent. Supplemented diversion was 1.8 GL out of a total entitlement of 2.6 GL.

There were three passflow events completed at Alan Tannock Weir in September and October 2008. It is unusual for passflow provisions to be triggered in this system.

The majority of take is associated with water allocations with flow conditions (water harvesting). Diversion for 2008–09 was 1.2 GL.

There were two water harvesting events announced in the Lower Warrego Water Management Area for 2008–09. Take is measured by metered works. However, metering of some of the larger works had been deferred until National Standards had been finalised. Queensland is intending to complete metering on these works during the later part of the 2009–10 water year. 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.

### Table 17: Annual diversions compared to cap targets (GL)

| System               | Long-term diversion cap | This year’s cap target | Net trade from valley | This year’s stream diversion | Overland flow (floodplain harvesting) | This year’s diversion for Cap reporting purposes | Cap credits (target less diversion) | Cumulative since 1/7/1997 | 20% schedule trigger | Trigger exceeded | Storage Difference |
|----------------------|-------------------------|------------------------|-----------------------|------------------------------|--------------------------------------|---------------------------------------------|---------------------------------|--------------------------|----------------------|---------------------|-------------------|----------------------|
| Warrego              | 47.9                    | 16.3                   | 0                     | 3                            | 3                                   | 13.3                                        | n/a                             | n/a                      | No                   | n/a                 | n/a               |
| Paroo                | 0.18                    | 0.18                   | 0                     | 0.02                         | 1                                   | 0.16                                        | n/a                             | n/a                      | No                   | n/a                 | n/a               |
| Nebine¹              | 6.4                     | 5.0                    | 0                     | 0.02                         | 0.07                                | 0.09                                       | 4.9                             | n/a                      | n/a                  | n/a                 | n/a               |
| Moonie¹              | 34.9                    | 36.0                   | 0                     | 23                           | 6                                   | 29.0                                       | 7.0                             | n/a                      | No                   | n/a                 | n/a               |
| Border Rivers (Qld)  | 250.3                   | 145                    | 8                     | 138                          | 10                                  | 138                                         | 35                              | 35°                      | n/a                  | n/a                 | n/a               |
| Condamine and Balonne| n/a                    | n/a                    | 0                     | 157                          | 18                                  | n/a                                        | n/a                             | n/a                      | n/a                  | n/a                 | n/a               |
| TOTAL                | n/a                     | n/a                    | -8                    | 321                          | 38                                  | n/a                                        | n/a                             | n/a                      | n/a                  | n/a                 | n/a               |

1. Cap values include modelled overland flow component
2. Cap target includes estimated overland flow
3. Cap Diversion target includes estimated overland flow
4. Cumulative since 1/7/2008 only
Annual diversion (excluding floodplain harvesting) of 3 GL was only 18% of the Cap target of 16.3 GL. Water entitlement holders did not fully avail themselves of access opportunities provided during the year for a number of reasons, including property development works and entitlements not fully developed. Since July 2006, the Warrego has, after allowing for floodplain harvesting, only diverted 35% of its Cap.

Paroo

Resource Availability
Rainfall recorded for 2008–09 at Hungerford in the southern part of the Paroo catchment was 207 mm. This was significantly below the total recorded last year and slightly below the long-term average of 292 mm. The peak monthly rainfall received was again in December 2008 with 51 mm falling—against the long-term median for December 2008 of 15 mm.

Stream flow at Caiwarro, the last gauged location on the Paroo in Queensland, was 138 GL for 2008–09. This is well below the average annual flow at Caiwarro of 516 GL (1968 to 2009) and significantly below the 1,449 GL recorded in 2007–08. Nevertheless, a number of small flows spread throughout the year resulted in stream flow being recorded for 235 days, comparing favourably with the average of 216 days per year.

No supplemented water supply exists in this catchment. There are only two unsupplemented water allocations in the Paroo catchment. Diversion was 16 ML with 10 ML of that taken for town water supply at Hungerford. The annual diversion (excluding overland flow harvesting) of 16 ML was 9% of the 2008–09 Cap target of 180 ML.

Nebine

Resource availability
Rainfall was above average in the Nebine catchment with 466 mm recorded at Mulga Downs for the 2008–09 water year against an average of 397 mm. The peak monthly total of 85 mm was recorded in June 2009 which was the highest recorded June since 1948.

Mean annual flow from the Nebine catchment (including the Noorama and Widgeegoara Creeks) is estimated at 33 GL per year. Flows discharge into the Culgoa River predominantly in New South Wales.

The new gauging station installed at Roseleigh Crossing (on Nebine Creek) now has two 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 occurred primarily in the summer period (January-February, plus the unusual June event), at the Roseleigh Crossing station. The events in Wallam Creek at Cardiff (upstream of Bollon) were in November 2008 and February 2009.

Flows in Wallam Creek at Cardiff and Nebine Creek at Roseleigh for 2008–09 totalled around 5 GL and 8 GL respectively. Records for the Nebine catchment are relatively recent, so recorded averages are not discussed as the figures are not indicative of long-term values.

No supplemented water supply exists in this catchment. The majority of the 32 unsupplemented water allocations in the Nebine catchment have flow conditions that relate to the take from watercourses (water harvesting). The summer flow period provided some water harvesting opportunity though take was primarily in the May/June period. In-stream diversion for 2008–09 has been recorded at 23 GL.
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November 2008 to February 2009 and in May 2009. Maximum flow peak recorded was just under 16 GL a day. Over the 2008–09 year, 29 GL passed Goondiwindi in total. These flows include supplemented releases from dam storages in the catchment which kept the stream ‘wetted up’ over the period. While the total is a little more than last year it is still well below the annual average of 970 GL.

Flow over Mungindi Weir totalled about 106 GL, a similar figure to that recorded over the last four years.

There are two major water supply storages in the Queensland part of the Border Rivers catchment. At 1 July 2008, Glenlyon Dam, the major storage for the Borders Rivers Water Supply Scheme (BRWSS), was at 35 per cent of capacity with around 27 GL available for general use from the Queensland share of the storage. Despite small inflows in December 2008 and May 2009, the storage finished the year at 24 per cent of capacity with around 15 GL available for 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 71 per cent of capacity (49 GL) with 24.9 GL in storage accounts and, despite small inflows in November 2008 and May 2009, finished the year just under 40 per cent of capacity with 13.5 GL in storage accounts (excluding the 7.6 GL in the BRWSS account).

In the 12 months to 30 June 2009, 25 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 3.8 GL provided from the Macintyre Brook Water Supply Scheme. The take of water transferred from NSW (8.4 GL net) is also included in the total.

A total of 11.3 GL of supplemented water was diverted in the Macintyre Brook Water Supply Scheme.

The minor flows predominately over summer triggered water harvesting (unsupplemented water) access under water sharing rules on the Border Rivers with 5.4 GL diverted over five events. Water harvesting thresholds were also triggered in the Weir River with 38.6 GL diverted in this catchment over a number of events.

A further 8.4 GL was diverted for both water harvesting and irrigation purposes in the Granite Belt area taking the total unsupplemented diversions in the Border Rivers to 101.3 GL for 2008–09.
The majority of diversion in this catchment is metered. Essentially all take under water allocations is metered and take under water licences is primarily unmetered.

**Cap compliance**

The Cap target for the Border Rivers has been calculated on an interim basis at this time as the hydrologic model for the valley has not been accredited.

The 2008–09 annual diversion for the Border Rivers Valley was 148 GL (including overland flow harvesting), which is 81% of the trade adjusted Cap target of 183 GL. This Cap target has also been increased by the observed overland flow harvesting in the valley of 10 GL.

**Condamine and Balonne**

**Resource availability**

Rainfall was generally slightly below average across the Condamine area. Annual rainfall across the area varied from 550 mm – 650 mm against an average of 670 mm. The summer rainfall was significantly below average, though heavy falls in November 2008 generated moderate stream flow.

The highest monthly total for the upper and middle areas was received in November 2008, with nearly double the average recorded. The records indicate a more even spread of rain across the year at Chinchilla, representing conditions in the lower part of the Condamine catchment.

The flow event in November 2008 along with the subsequent December event passed along the entire Condamine system with the later May and June 2009 events not passing into the middle catchment area. 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 103 GL passed Cotswold at the end of the Condamine system in 2008–09 compared to the long-term average of 620 GL. The flow past Chinchilla (located upstream) for the same period totalled 88 GL.

The major storage for the Upper Condamine Water Supply Scheme, Leslie Dam, started the year at 15% capacity and, with only minor inflow recorded in November 2008 and May 2009, it finished at 13%. No irrigation water was supplied from the storage during the year.

Chinchilla Weir started the year at 65% capacity and filled in the November 2008 flow events. The weir over topped again in February 2009 and finished the year at 70%. Announced allocation for the Chinchilla Weir Water Supply Scheme was 100%. This water supply scheme operates on a 1 October to 30 September water year.

A total of 19.1 GL of supplemented water was diverted in the Condamine catchment in 2008–09, with 16.4 GL diverted in the Upper Condamine scheme and 2.7 GL at Chinchilla.

Two moderate flows occurred over the summer period which triggered water harvesting access along the trunk stream, with access also occurring in most tributaries over this period. Subsequent flows in May 2009 and June 2009 did not extend along the entire trunk system though they also provided access in tributaries in the upper and lower sections of the Condamine. There were six water harvesting events announced over the period in the Upper Condamine Water Management Area.

The volume taken over 2008–09 is estimated at 60.5 GL with the total split relatively evenly between the upper, middle and lower sections. About 10 GL of this total was diverted for direct irrigation with 5.3 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.

**Balonne**

**Resource availability**

Rainfall in the Balonne and Maranoa was slightly below average at both St George and Mitchell with recorded rainfall in the order of 450 mm and long-term averages in the range 500 mm to 550 mm. St George recorded the wettest September since 1970 with a peak monthly total of 80 mm. Conversely March 2009, with just 0.3 mm, was very dry.

Well above-average rainfall recorded in September 2008 resulted in only a small flow with a moderate flow occurring in the Upper Balonne comprising flow through from the Condamine plus tributary inflow in late November early December 2008. This flow essentially carried on until mid-January 2009. Subsequent flows in February and May 2009 maintained much of the trunk stream in good condition with most waterholes full at the end of the year. This was not the case in the Maranoa which recorded its lowest year since 1978 with 88 ML passing compared to an average of 115 GL.
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Beardmore Dam started the year at 42% and had a very small inflow in September 2008 followed by good inflows from November 2008 to February 2009 with storage reaching 75% before falling to finish the year at 53%.

Inflows up to 730 ML a day may be passed downstream for stock and domestic supplies, or are sometimes held in storage for later release to maximise benefit to downstream water users. A total of 58.6 GL of stock and domestic passflow was released downstream over four release events, with significant environmental benefits in this otherwise very dry year.

A total of 65.6 GL (including 63 ML from the Maranoa Water Supply Scheme) was diverted from water supply schemes as supplemented water.

Flows in the upper Balonne (and tributary) area resulted in triggering a small number of flow condition based water allocations upstream of Beardmore Dam. Total estimated take is 11.8 GL, of which about 70% was taken from the trunk stream.

Diversion did not occur in the areas downstream of St George and there was also very little opportunity in the Maranoa catchment.

The water planning process has not yet been completed for this valley; therefore it was not possible to provide Cap target comparisons for 2008–09.

4.4.3 Monitoring and Reporting

Cap models for the Warrego, Paroo, Nebine, Moonie and Queensland Border Rivers valleys have been submitted for accreditation and are presently being reviewed by the independent auditor. Water diversions in 2008–09 are reported against the Caps targets for these valleys.

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. Queensland has reported on their compliance with the Cap for the Queensland Border Rivers Valley for 2008–09.

It is anticipated that accreditation of Cap models for the Warrego, Paroo, Nebine, Moonie and Queensland Border Rivers will be finalised in 2009–10.

Finalisation of the Condamine and Balonne Resource Operations Plan has been delayed due to a legal action which may alter provisions in the Lower Balonne section of the Plan. A Cap proposal for the Condamine and Balonne valley will be submitted within six months of completion of that water planning process, presently expected to be completed by mid 2010. The Cap model will be submitted for review by the independent auditor following approval of the Cap submission.

4.4.4 IAG Assessment

Excluding overland flow harvesting, the diversion of 321 GL in 2008–09 was considerably less than the 2007–08 diversions of 876 GL. This reflects the episodic nature of flow events in the Queensland Basin valleys.

For those valleys where Caps have been set, diversions in 2008–09 were well within Cap targets. Some overland water harvesting has not been fully accounted for in modelling undertaken. The moratorium on the undertaking of new works on these valleys where overland water harvesting occurs effectively caps diversions of water to levels within the agreed Cap. In 2008–09, estimated diversion of water by way of overland water harvesting was of the order of 38 GL. Including overland flow harvesting, diversion of 359 GL was less than last year’s total diversion of 1,054 GL.

The IAG is pleased to be able to report diversions on the Queensland part of the Border Rivers using the interim Cap model. While the model needs to be accredited, the IAG is of the view that reporting performance, albeit against an interim model for the Queensland part of the Border Rivers, assists in informing interested stakeholders of the performance of the Cap.
The IAG notes that finalisation of a Cap for the Condamine-Balonne valley has been further delayed by a legal challenge. Assuming that this matter can be satisfactorily resolved in 2009–10, a Cap using a Cap model for the Condamine Balonne should be available for reporting purposes for the 2009–10 water year.

The IAG notes that models developed for the Queensland system needed to rely upon a wide range of information. In part, this has included ‘irrigator estimates’ of some diversions occurring off the flood plains. These are pre-existing works authorised under the moratorium. Not all of these diversions have been fully accounted for at this stage.

While it is intended that the process of metering and adoption of new technology to capture off take quantities will gradually result in improved data for these diversions, modelling and monitoring processes will initially rely on information requiring independent determination. This is not considered a major issue, but will have some implications for the models and operating plans as more reliable information becomes available. For larger flood plain 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 Programs are in place through the state-wide metering project to finalise metering of those areas not yet 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, effectively monitoring the operation of licences and off take of water in accordance with those licences.

4.4.5 Conclusions / Recommendations

- Including overland flow harvesting, total diversion from the Queensland section of the Murray-Darling Basin was 359 GL in 2008–09.
- Excluding overland flow diversions, diversion of 321 GL in 2008–09 was considerably less than the record diversion in 2007–08.
- Reflecting lower flow levels in 2008–09, cross border flows were only 391 GL compared to more than 3,200 GL in 2007–08.
- 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 annual diversion targets;
- The Cap and Resource Operations Plan 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 current legal challenge has been resolved and Queensland expects to submit the Cap proposal within six months of finalisation of the plan;
- 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.
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4.5 Australian Capital Territory

4.5.1 The Cap

An ACT Cap was agreed by the Ministerial Council at meeting 45 on 23 May 2008. The Ministerial Council:

- defined the Cap for the Australian Capital Territory as:

  Until the Basin Plan in the Water Act 2007 (Cth) comes into effect, the ACT Cap is:
  
  1. 40 GL (42 GL minus 2 GL saving allocated to The Living Murray) climate-adjusted as recommended by the IAG; plus
  
  (ii) ACT Cap is reviewed and increased by 0.75 of the current per capita consumption of water for population growth of Canberra and Queanbeyan consumption;

  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 that the Commonwealth and the ACT 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 SA Cap.

Gross diversions and returns are provided in Table 18.

Having now agreed a Cap the ACT has reported on its diversion of water in 2008–09 against this Cap.

The ACT is developing a revised Cap model which contains a method for reducing the annual Cap targets based on historical restrictions. Although further development is required, the provisional Cap target for 2008–09 calculated by this model was 29.7 GL. This brings the cumulative Cap credit calculated from 1997–98 to 129 GL which implies that ACT diversions have been 37% below their Cap targets over this period.

Water diversion data for diversions from the ACT controlled by the Commonwealth (chiefly from Lake Burley Griffin) and not licensed by the ACT Government are not yet available. Diversions reported in Table 18 relate only to those made under licences issued by the ACT Government. However, the ACT estimates that diversion of water controlled by the Commonwealth is less than 1 GL/year.

4.5.2 Administration of the Cap

As in recent years, demand management programs continued to have significant impact on both internal and external urban use in the ACT during 2008–09. Internal water use continues to fall steadily from a high of 46 GL (net) in 1990–91 despite the growth in the population and was the second lowest recorded in 16 years at 18.7 GL. Stage 3 water restrictions again remained in force for the whole of 2008–09.

Stream inflows in the ACT region again continue to be very low. Storage levels remained below 50% for the whole of the year reinforcing a need to increase security of the urban water supply.

In May 2008 the ACT referred to the then Commission a proposal to enlarge the Cotter Dam to a capacity of 78 GL under the provisions of Clause 46 of the Murray-Darling Basin Agreement. It is anticipated enlargement of the dam will not have a significant effect on the availability or flows in the remainder of the Murray-Darling River system. A report was sent to the then Murray-Darling Basin Commission in November 2008 on the impact of an enlarged Cotter Dam and was subsequently considered by way of the Natural Resources Management Committee process of the MDBC. Construction will commence on this enlarged Cotter Dam in late 2009 or early 2010.

Table 18 Diversions for Consumptive Use within the ACT and Queanbeyan (GL)

<table>
<thead>
<tr>
<th>System</th>
<th>Long-term Diversion Cap</th>
<th>ACTEW diversion</th>
<th>Direct diversion</th>
<th>LMWQCC return</th>
<th>GSTP return</th>
<th>Net diversion</th>
<th>Net trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>40</td>
<td>45.0</td>
<td>1.5</td>
<td>25.2</td>
<td>2.6</td>
<td>18.7</td>
<td>nil</td>
</tr>
</tbody>
</table>
Other projects being undertaken to give greater security to the ACT’s urban water supplies include the Murrumbidgee River (at Angle Crossing) to Googong Dam Water Transfer Project. This involves construction of a pipeline and pumping system to deliver water from the Murrumbidgee to Googong Dam which is located on the Queanbeyan River.

To provide access to water within the Cap requirements, the ACT is purchasing general water security licences from the Murrumbidgee River valley downstream of the ACT with the intention that water attached to these licences be stored in Tantangara Dam. The project entails ACT entering into a commercial agreement with Snowy Hydro Limited for the storage and delivery of water relating to these licences from the Snowy Mountains Scheme to the ACT via releases into the Murrumbidgee River.

In response to its obligations under the Cap, the ACT has been holding discussions with the Commonwealth concerning water planning and management issues associated with the use of water by the Commonwealth and others from Lake Burley Griffin. It is expected that these discussions will result in a clear statement of responsibilities and obligations in relation to those diversions allowing the ACT to meet its Cap reporting requirements as outlined above. These intergovernmental arrangements are expected to be finalised in 2009–10.

There were no new industrial use or new Commonwealth water requirements in 2008–09 and hence no call for the trading in of additional water under the ACT Cap arrangements.

4.5.3 Monitoring and Reporting

The ACT has established a system of volumetric licences for all users of water in the ACT. The ACT is able to report its consumptive usage against information provided by licence holders. As ACTEW Corporation (the water service provider in the ACT) will be the main licensed user of water from the system the level of accuracy from this monitoring process will be high. Issue of licences to groundwater and other surface water users, 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 data on water use in the ACT.

During 2008–09, the ACT developed the first draft of a Cap model to meet requirements of the decision on the ACT Cap by the Ministerial Council. The ACT proposes to use the potable demand modelling of ACT and Queanbeyan water use as developed by ActewAGL. This model is climate-adjusted and separately accounts for the variables of water restrictions and population growth and currently being discussed with MDBA officials prior to submission for formal auditing.

4.5.4 IAG Assessment

Net diversions in the ACT in 2008–09 of 18.7 GL were the second lowest for the past 16 years. These results do not include Commonwealth diversions which, in gross terms, are possibly no more than 1 GL.

The ACT is currently in discussion with the Commonwealth to formalise a process whereby, in future, Commonwealth diversions will be captured by the ACT reporting process.

A climate-adjusted model is currently being developed and expected to be submitted for auditing and formal accreditation during 2009–10. The IAG notes that its recommendations to the Council for acceptance of the ACT Cap proposal included the proviso ground water usage would also be included in the ACT Cap. The IAG therefore expects that ground water usage (estimated to be around 1 GL) will also be included in the ACT Cap modelling and future reporting.

The ACT Cap determination also incorporated an allowance of 5 GL for unmetered use and use by rural land holders. Now that the ACT has completed its metering program, the IAG considers diversions for these users should also be included in the climate-adjusted Cap model.

The ACT has the licensing and administrative arrangements in place allowing reporting of its performance under the proposed climate-adjusted Cap.

The IAG welcomes the formalisation of the agreement on a Cap for the ACT and the progress made in implementing terms of the agreed Cap. The IAG also acknowledges the timely advice on progress with the Cap provided by the ACT.
4. Audit of Cap Implementation 2008–09

4.5.5 Conclusions/Recommendations

- A climate-adjusted Cap for the ACT has now been agreed and work is proceeding on development of a climate-adjusted model.

- Net diversions of 18.7 GL in 2008–09 were well below the Cap target of 29.7 GL calculated by the provisional ACT Cap model.

- The ACT needs to include all surface and ground water diversions in the reporting of “other diversions” under the agreed Cap.

- The ACT 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 the finalisation of the climate-adjusted model to be used to administer the Cap.

- Recognition diversions by the Commonwealth should also be reported by the ACT as part of use of the ACT Cap, discussions between the ACT and Commonwealth are welcomed and expected to provide an agreement on measures necessary to meet this requirement during 2009–10.

5.1 Summary of Diversions 2008–09

Murray-Darling Basin diversions in 2008–09 totalled 4,133 GL. This was the lowest annual diversion since 1956–57 and only 32% of the record diversion of 12,964 GL in 1996–97. Diversions for individual valleys in the Murray-Darling Basin are presented in Table 19.

Table 19—Murray-Darling Basin Diversions in 2008–09

<table>
<thead>
<tr>
<th>System</th>
<th>Total Diversion</th>
<th>Percentage of Basin Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intersecting Streams</td>
<td>3</td>
<td>0.1%</td>
</tr>
<tr>
<td>Border Rivers</td>
<td>138</td>
<td>3.3%</td>
</tr>
<tr>
<td>Gwydir</td>
<td>154</td>
<td>3.7%</td>
</tr>
<tr>
<td>Namoi/Peel</td>
<td>188</td>
<td>4.6%</td>
</tr>
<tr>
<td>Macquarie/Castlereagh/Bogan</td>
<td>104</td>
<td>2.5%</td>
</tr>
<tr>
<td>Barwon-Darling/Lower Darling</td>
<td>159</td>
<td>3.8%</td>
</tr>
<tr>
<td>Lachlan</td>
<td>40</td>
<td>1.0%</td>
</tr>
<tr>
<td>Murrumbidgee</td>
<td>601</td>
<td>14.5%</td>
</tr>
<tr>
<td>Murray</td>
<td>341</td>
<td>8.3%</td>
</tr>
<tr>
<td>Total NSW</td>
<td>1729</td>
<td>41.8%</td>
</tr>
<tr>
<td>Victoria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goulburn/Broken/Loddon Cap Valley</td>
<td>639</td>
<td>15.5%</td>
</tr>
<tr>
<td>Campaspe</td>
<td>28</td>
<td>0.7%</td>
</tr>
<tr>
<td>Wimmera-Mallee</td>
<td>11</td>
<td>0.3%</td>
</tr>
<tr>
<td>Murray/Kiewa/Ovens Cap Valley</td>
<td>862</td>
<td>20.9%</td>
</tr>
<tr>
<td>Total Victoria</td>
<td>1541</td>
<td>37.3%</td>
</tr>
<tr>
<td>South Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro-Adelaide &amp; Associated Country Areas</td>
<td>150</td>
<td>3.6%</td>
</tr>
<tr>
<td>Lower Murray Swamps</td>
<td>11</td>
<td>0.3%</td>
</tr>
<tr>
<td>Country Towns</td>
<td>37</td>
<td>0.9%</td>
</tr>
<tr>
<td>All Other Uses of Water from the River</td>
<td>288</td>
<td>7.0%</td>
</tr>
<tr>
<td>Murray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total South Australia</td>
<td>486</td>
<td>11.8%</td>
</tr>
<tr>
<td>Queensland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condamine/Balonne</td>
<td>175</td>
<td>4.2%</td>
</tr>
<tr>
<td>Border Rivers/Macintyre Brook</td>
<td>148</td>
<td>3.6%</td>
</tr>
<tr>
<td>Moonie</td>
<td>29</td>
<td>0.7%</td>
</tr>
<tr>
<td>Nebine</td>
<td>0.09</td>
<td>0.0%</td>
</tr>
<tr>
<td>Warrego</td>
<td>6</td>
<td>0.1%</td>
</tr>
<tr>
<td>Paroo</td>
<td>1.02</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total Queensland</td>
<td>359</td>
<td>8.7%</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>19</td>
<td>0.5%</td>
</tr>
<tr>
<td>Total Basin</td>
<td>4133</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Diversions over the last seven years constitute seven of the lowest nine years of usage in the 26 year period since 1983–84. During this period, total Basin diversions in 2008–09 ranked 26; diversions in NSW ranked 25; Victorian diversions ranked 26, SA 23, Queensland 17 and the ACT 23. Of total water diverted, New South Wales diverted 42%, Victoria 37%, Queensland 9%, South Australia 9% and the Australian Capital Territory 0.5%. Annual diversions since 1983 are plotted in Figures 1 and 2.

Figure 1. Murray-Darling Basin Diversions–1983/84 to 2008-09

Figure 2. Murray-Darling Basin Diversions–1983/84 to 2008-09 (Queensland, South Australia and ACT)

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 operation of 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 last year’s Report, the IAG has determined that it will publish historical series of all valley models and performance against the modelled Caps where information is available.

It is not the IAG’s intention that performance of any one State or valley should be judged on historical performance other than for the most recent year. Rather, it is the intention to provide information which will help to inform the Ministerial Council and other readers of past performance which may be of assistance 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

![Graph showing Cap Compliance—South Australian Country Towns](image-url)
Figure 4. Cap Compliance–South Australian Lower Murray Swamps

Figure 5. Cap Compliance–South Australian All Other Purposes

Figure 6. Cap Compliance–Victorian Goulburn/Broken/Loddon

Figure 7. Cap Compliance–Victorian Murray/Kiewa/Ovens
Figure 8. Cap Compliance—Victorian Campaspe

Figure 9. Cap Compliance—Victorian Wimmera-Mallee
5. Diversions from the Murray-Darling Basin in 2008–09

Figure 10. Cap Compliance–NSW Barwon-Darling

Figure 11. Cap Compliance–NSW Lower Darling
Figure 12. Cap Compliance–NSW Barwon-Darling/Lower Darling

Figure 13. Cap Compliance–NSW Gwydir

Figure 14. Cap Compliance—NSW Namoi/Peel

![Graph showing Cap Compliance—NSW Namoi/Peel](image)

Figure 15. Cap Compliance—NSW Macquarie/Castlereagh/Bogan

![Graph showing Cap Compliance—NSW Macquarie/Castlereagh/Bogan](image)
Figure 16. Cap Compliance—NSW Lachlan

Figure 17. Cap Compliance—NSW Murrumbidgee

Figure 18. Cap Compliance–NSW Murray

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


SOUTH AUSTRALIA

The IAG notes South Australia has significantly progressed actions as requested by the IAG. An update on the progress is provided below.

Development of a new climate-adjusted model for Metropolitan Adelaide and Associated Country Areas is currently under development and will take into account urban demand, local water availability in the Mount Lofty Ranges storages, system operation rules and makes allowance for water restrictions. Work is currently progressing, a few minor technical issues being fixed and a draft model will be provided by December 2009 for internal review and accreditation within South Australia.

The model will subsequently be made available to the Authority in January 2010 for discussion and review. South Australia aims to have the accreditation process expedited and to have the model approved by Ministerial Council in 2010. This will allow South Australia to use the model for the 2009–10 Metropolitan Adelaide Cap performance assessment.

In the All Other Purposes, Lower Murray Swamps and Country Towns Cap Valleys a provision for water restrictions has now been included in the ap calculations. The process now restricts growth of cumulative Cap credits and South Australia believes this is a responsible step in implementing the Cap across the Murray-Darling Basin. South Australia will submit a formal report to the Authority within the next two months detailing the approval process required for implementing this restriction component.

The IAG requested the All Other Purposes Cap be reduced by 50 GL for water purchased by the South Australian Government to manage acid sulphate soils in the Lower Lakes. The adjustment has been undertaken.

The All Other Purposes and Lower Murray Swamps will be combined into a single Cap Valley and the Environmental Land Management Allocation will remain a non-tradeable entitlement within a new Cap for all other non-urban diversions. Work is currently progressing on this issue and a formal request will be provided to the Authority in early 2010. South Australia will work with the Authority to enhance the current All Other Purposes Cap model to include the Lower Murray Swamp entitlements.

It is no surprise that a Special Audit of the Barwon-Darling/Lower Darling Cap valley was again required. South Australia strongly agrees with the IAG’s view that the 186 GL debit for this Cap valley is unlikely to be reduced in the near future. South Australia believes alternative management arrangements need to be implemented for the 2010-11 water year to ensure over-allocation in this part of the Murray-Darling Basin is addressed as an immediate priority to ensure diversions remain below the cumulative annual diversion target.

South Australia recognises the importance of the lessons learned in the development of the Cap and looks forward to these influencing the Basin Plan and the implementation of Sustainable Diversion Limits across the Murray-Darling Basin.
Victoria continued to implement the Cap on regulated systems by establishing Bulk Entitlements in accordance with the Water Act 1989 and Streamflow Management Plans on unregulated streams. No new capping measures were introduced in 2008/09 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 2008/09 Cap targets and cumulative credits for these valleys. An interim model, submitted to the MDBA for accreditation, has been used to calculate Cap targets and cumulative credits for the Wimmera-Mallee valley.

Diversions since July 1997 from each of Victoria’s four designated valleys continue to comply with the Cap. Diversions from the Campaspe, Goulburn/Broken/Loddon and Wimmera-Mallee valleys were at or below their Cap targets, whilst diversions from the Murray/Kiewa/Ovens valley were slightly above the Cap target in 2008/09.

Victoria proposes to improve the performance of its hydrological models where practicable. Improvements to loss relationships in the Campaspe model have been made to better simulate system performance in the current severe drought. The Murray model has also been updated by the MDBA to improve its representation of the Lower Darling system. These model improvements will be reviewed by the Water Audit Panel before being approved by the Murray Darling Basin Authority.

Victoria remains committed to provision of additional water for the environment and reduction of the Cap when environmental flows are increased. A paper describing the method Victoria proposes to apply when reducing the Cap to exclude environmental entitlements has been submitted to the Authority for approval. This paper covers existing environmental entitlements and those soon to be created from various water recovery initiatives.

Data submitted to the IAG for 2008/09 has been adjusted for environmental use by applying the method described in the above paper. 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.
On-going drought conditions continue to force significant changes to normal water management for the third water year in succession. In 2008/09, a range of drought contingency measures remain 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. NSW continues to support the IAG recommendations to take into account the impacts of this drought, to ensure that the MDBMC Cap assessment process continues to be robust.

Despite the current sequence of record low water availability, NSW continues to implement and comply with the Murray-Darling Basin Ministerial Council Cap on diversions in all regulated river valleys within the M-DB. NSW acknowledges that it is in breach of the Cap on diversions in the Barwon-Darling:Lower Darling River valley.

As with previous reports the 2008/09 report of the Independent Audit Group indicates that diversions in all NSW valleys are currently within Cap, with the exception of the NSW Border Rivers, where Cap reporting will soon commence, and the Barwon-Darling:Lower Darling valley.

NSW 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 will ensure that, over time, diversions will 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.

Under the current strategy it would be expected that diversions will be below those under 1993-94 levels of development in wetter seasons and that during these years cumulative extractions will tend back toward Cap compliance. However, recent years have been dominated by drought and reduced water availability, and extractions in the Barwon-Darling, although being below average annual extractions, have exceeded the annual Cap targets that are determined retrospectively for each year.

Despite maintaining its current strategy will result in long-term Cap compliance, NSW will be exploring further management options and limits to extraction in the Barwon-Darling Valley to bring cumulative extractions back to Cap over a relatively shorter term, albeit that this term cannot be quantified as it will depend on water availability due to seasonal conditions.

NSW continues to make significant progress towards accreditation of valley models under Schedule F for Cap auditing, with the only remaining Cap models for major river systems to be presented for accreditation being the Barwon-Darling, and NSW Border Rivers.
Queensland notes that the IAG has brought forward their annual audit for the 2008/2009 water year. As such it is only able to report on a provisional basis for supplemented water taken in the April 2009 to June 2009 quarter. More timely reporting of water use against cap in the Queensland Murray Darling Basin valleys is supported and Queensland will look to establishing tighter reporting timelines with service providers for the 2009/10 water year.

Queensland is planning to amend the Condamine and Balonne Resource Operations Plan in the 2009/10 year to include the Lower Balonne Area depending on resolution of a judicial review action. A Cap proposal will be submitted within six months of a resource operations plan being in place for the whole of the Condamine-Balonne catchment.

Caps will then be established for all of the Queensland Murray Darling Basin valleys and the focus will increasingly move to monitoring and measuring. At this stage metering of all major watercourse extractions is expected to be complete by the end of 2011. Measurement of overland flow take is more challenging but not as urgent with overland flow effectively capped in Queensland by regulation of infrastructure.

The extent to which the balance of metering can comprehensively roll out across Queensland valleys in the time frames desired is dependent on a number of factors including competition with broader state wide priorities, the levels of and timing of government funding being directed at this sort of work and having feasible measurement technologies available.

Accounting for environmental water will become an issue for Queensland for the first time in the 2009/2010 year with the Commonwealth Environmental Water Holder now holding Queensland water allocations in the Border Rivers valley.

Additionally 2009/10 will herald our first insights into how the basin planning process will deal with the setting, implementation and auditing of diversions across the valleys of Murray Darling.
Appendix A: Responses by the five State and Territory governments

AUSTRALIAN CAPITAL TERRITORY

The volume of gross diversions and net diversions for the 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 second lowest on record (ie since 1989-90). The decrease in diversions is largely due to the ACT consumption being constrained by compliance to level 3 temporary water restrictions which have been applied since November 2006.

The ACT 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.

Net diversions for 2008-09 are well within the agreed Cap.

The ACT has been developing a Cap model on potable demand of ACT and Queanbeyan water use. It is largely the model developed by ActewAGL for ACT and Queanbeyan water use. The model is climate-adjusted and incorporates adjustments for population growth. The ACT has already had preliminary meeting with the MDBA on the ACT Cap model and will submit the final version of its Cap model later this year. As with other jurisdictions groundwater diversions are not part of the agreed ACT Cap.

It was not a responsibility for the ACT 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, the ACT and the Commonwealth are working towards an agreement for the management by the ACT of Commonwealth controlled water, namely Lake Burley Griffin. This will require legislation by both the Commonwealth and the ACT. The ACT will not have rights to this water as such. Once the legislative arrangements have taken place the management of this water will be reported separately. The volume of Commonwealth diversions are no more than 1 GL.

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

<table>
<thead>
<tr>
<th>ACTEW</th>
<th>ACT Electricity and Water Corporation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>announced allocation</td>
<td>The percentage of water entitlement declared available for diversion from a regulated stream in a season.</td>
</tr>
<tr>
<td>annual allocation</td>
<td>The annual volume of water available for diversion from a regulated stream by an entitlement holder.</td>
</tr>
<tr>
<td>authorised use</td>
<td>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.</td>
</tr>
<tr>
<td>Border Rivers</td>
<td>The rivers and tributaries forming or intersecting the border between NSW and Queensland.</td>
</tr>
<tr>
<td>Bulk Entitlement</td>
<td>A perpetual entitlement to water granted to water authorities by the Crown of Victoria under the <em>Water Act 1989</em>.</td>
</tr>
<tr>
<td>carryover</td>
<td>An unused entitlement from one season that can be used in the next year.</td>
</tr>
<tr>
<td>channel capacity</td>
<td>The maximum rate at which water can be delivered through a river reach or an artificial channel.</td>
</tr>
<tr>
<td>COAG</td>
<td>Council of Australian Governments.</td>
</tr>
<tr>
<td>diversion</td>
<td>The movement of water from a river system by means of pumping or gravity channels.</td>
</tr>
<tr>
<td>diversion licence</td>
<td>Specified licences issued for a specified annual volume and diversion rate.</td>
</tr>
<tr>
<td>DNR</td>
<td>The Department of Natural Resources (of NSW).</td>
</tr>
<tr>
<td>DNRMW</td>
<td>The Department of Natural Resources Mines and Water (of Queensland).</td>
</tr>
<tr>
<td>DSE</td>
<td>The Department of Sustainability and Environment (of Victoria).</td>
</tr>
<tr>
<td>dozer allocation</td>
<td>An allocation that is not fully utilised.</td>
</tr>
<tr>
<td>DWLBC</td>
<td>The Department for Water, Land and Biodiversity Conservation (of South Australia).</td>
</tr>
<tr>
<td>EC (unit)</td>
<td>Electrical conductivity unit 1 EC = 1 micro-Siemens per centimetre measurement at 25o Celsius. Commonly used to indicate the salinity of water.</td>
</tr>
<tr>
<td>end-of-valley flows</td>
<td>The flow regime at the end of a valley.</td>
</tr>
<tr>
<td>floodplain harvesting</td>
<td>The diversion of water from a floodplain into storage(s).</td>
</tr>
<tr>
<td>FMIT</td>
<td>First Mildura Irrigation Trust.</td>
</tr>
<tr>
<td>gigalitre (GL)</td>
<td>One thousand million or 109 litres.</td>
</tr>
<tr>
<td>GL</td>
<td>Gigalitre: one thousand million or 109 litres.</td>
</tr>
<tr>
<td>G-MW</td>
<td>Goulburn-Murray Water (of Victoria).</td>
</tr>
<tr>
<td>Glossary Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>gravity districts</td>
<td>Districts which use gravity to divert the flow of water from the river.</td>
</tr>
<tr>
<td>high security entitlement</td>
<td>An entitlement which does not vary from year to year and is expected to be available in all but the worst droughts.</td>
</tr>
<tr>
<td>IAG</td>
<td>Independent Audit Group.</td>
</tr>
<tr>
<td>LV</td>
<td>Licence Volume.</td>
</tr>
<tr>
<td>impoundment</td>
<td>The storage of water diverted from a watercourse.</td>
</tr>
<tr>
<td>irrigation</td>
<td>Supplying land or crops with water by means of streams, channels or pipes.</td>
</tr>
<tr>
<td>MDBA</td>
<td>Murray-Darling Basin Authority.</td>
</tr>
<tr>
<td>MDBC</td>
<td>The former Murray-Darling Basin Commission.</td>
</tr>
<tr>
<td>MDBC</td>
<td>Murray-Darling Basin Ministerial Council.</td>
</tr>
<tr>
<td>megalitre (ML)</td>
<td>One million litres. One megalitre is approximately the volume of an Olympic swimming pool.</td>
</tr>
<tr>
<td>Ministerial Council, the</td>
<td>Murray-Darling Basin Ministerial Council.</td>
</tr>
<tr>
<td>ML</td>
<td>Megalitre: one million litres. One megalitre is approximately the volume of an Olympic swimming pool.</td>
</tr>
<tr>
<td>Murray-Darling Basin Agreement</td>
<td>The Agreement between the Governments of the Commonwealth, NSW, VIC, SA, QLD, and the ACT. The current Agreement is the 2008 Agreement.</td>
</tr>
<tr>
<td>off-allocation</td>
<td>When unregulated tributary inflows or spills are sufficient to supply irrigation needs and downstream obligations.</td>
</tr>
<tr>
<td>on-farm storage</td>
<td>Privately owned storages used to harvest surplus flows or to store unused allocations for use in the following season.</td>
</tr>
<tr>
<td>overdraft</td>
<td>Water diverted in one season against a prospective allocation in the subsequent year.</td>
</tr>
<tr>
<td>overland flow</td>
<td>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.</td>
</tr>
<tr>
<td>permanent transfer</td>
<td>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.</td>
</tr>
<tr>
<td>private diverters</td>
<td>Licensed to operate privately owned pumps or diversion channels; includes river pumpers and diverters as well as town water supplies.</td>
</tr>
<tr>
<td>property right</td>
<td>In this context, the right to ownership of allocated volumes of water.</td>
</tr>
<tr>
<td>RAMSAR wetland</td>
<td>A wetland listed on the Register of internationally significant wetlands established by the Convention at Ramsar.</td>
</tr>
<tr>
<td>regulated streams/waterways</td>
<td>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.</td>
</tr>
<tr>
<td>riparian</td>
<td>Of, inhabiting or situated on the bank and floodplain of a river.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>RIT</td>
<td>Renmark Irrigation Trust.</td>
</tr>
<tr>
<td>sales water</td>
<td>In Victoria, water that may be purchased by an irrigator in addition to the basic water right. Access to sales water is announced each season as a percentage of Water Right depending on the available resource.</td>
</tr>
<tr>
<td>salinity</td>
<td>The concentration of dissolved salts in groundwater or river water usually expressed in EC units.</td>
</tr>
<tr>
<td>sleeper allocation</td>
<td>An allocation without a history of water usage.</td>
</tr>
<tr>
<td>temporary transfer</td>
<td>Water entitlements transferred on an annual basis.</td>
</tr>
<tr>
<td>unregulated streams</td>
<td>Streams not controlled or regulated by releases from major storages.</td>
</tr>
<tr>
<td>utilisation</td>
<td>The amount of water available for diversion that is actually diverted.</td>
</tr>
<tr>
<td>water entitlement</td>
<td>The legal right of a user to access a specified amount of water in a given period.</td>
</tr>
<tr>
<td>Water -harvesting</td>
<td>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.</td>
</tr>
<tr>
<td>WAMP</td>
<td>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.</td>
</tr>
<tr>
<td>WR</td>
<td>Water Right.</td>
</tr>
<tr>
<td>WSP</td>
<td>Water Sharing Plan. Plans developed under the New South Wales Water Management Act, 2000 for equitable sharing and management of NSW water resources.</td>
</tr>
<tr>
<td>WUE</td>
<td>Water Use Efficiency.</td>
</tr>
</tbody>
</table>