



Australian Government



MURRAY-DARLING BASIN AUTHORITY

Audit of The Living Murray Implementation 2007-08

Report of the Independent Audit Group

May 2009

Published by Murray-Darling Basin Authority

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This report may be cited as: *Audit of The Living
Murray Implementation 2007–08, Report of
the Independent Audit Group*, Murray–Darling
Basin Authority.

MDBC Publication No. 33/09

ISBN 978-1-921557-37-8

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Acknowledgments

The Independent Audit Group appreciated
the cooperation of the Australian, State and
Territory Governments and the Murray–Darling
Basin Commission in engaging positively in the
independent audit process, for making both data
and officers available, and for the open and frank
way in which the audit was conducted. Information
was freely provided and the identification of issues
as well as possible options for resolving them
were discussed openly and constructively. The
IAG also wishes to acknowledge the assistance
provided by the officers of the Murray–Darling
Basin Commission (MDBC) in the preparation of
this report. The findings however are entirely those
of the IAG.

AUDITOR'S FOREWORD

Senator Penny Wong
Chair, Murray-Darling Basin Ministerial Council
Suite MG60
Ministerial Wing
Parliament House
Canberra ACT 2600

Dear Minister

We have pleasure in submitting to you our *Audit of The Living Murray Implementation 2007–08*.

In our last report, *Audit of The Living Murray Implementation 2006–07*, we noted that water recovery measures totalling 273.85 GL were recorded on the Central Register as either 'implementation ready' or being implemented. At 30 June 2008, this volume has increased to 536.65 GL and includes 133 GL in measures already implemented and approved by Ministerial Council (i.e. entered on The Living Murray Environmental Water Register). The Independent Audit Group believes that the target of 500GL is likely to be achieved in the future although completion of the work by the target date of June 2009 remains of concern as does the low reliability of a significant part of the water portfolio, in view of the continued dry conditions.

Of the twenty nine recommendations made by Independent Audit Group in its first three audit reports, twenty one have been satisfactorily addressed and assessed as being completed, while significant progress has been made in relation to the other eight recommendations. The Independent Audit Group has made recommendations in relation to four additional issues identified in this current audit.

We hope that this audit is of value to you and the Ministerial Council.

Yours sincerely

DENIS FLETT
Chairman

PAUL BAXTER
Member

TERRY HILLMAN
Member

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EXECUTIVE SUMMARY

The following is a brief history of the main actions establishing The Living Murray (TLM):

- **April 2002:** The Murray-Darling Basin Ministerial Council agreed to invest \$150m in environmental works and measures and to investigate water recovery about three environmental flow reference points.
- **November 2003:** The Murray-Darling Basin Ministerial Council agreed to the First Step decision to invest \$500 million to recover up to 500 GL of water for TLM for management in conjunction with the environmental works and measures
- **June 2004:** First Ministers of the Murray-Darling Basin Ministerial Council signed the *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* (the Intergovernmental Agreement) providing a framework for the investment.
- **April 2005:** Intergovernmental Agreement operationalised through The Living Murray Business Plan, and included a requirement for the Independent Audit Group ('IAG') to audit progress in the implementation of The Living Murray. The Business Plan was updated in May 2007, and included the maintenance of this role for the IAG.
- **June 2006:** The Australian Government invested a further \$500 million through MDBC for additional water recovery (a notional \$200 million) and further

funding of the Environmental Works and Measures program (approximately \$100 million). This was endorsed through a Supplementary Intergovernmental Agreement by the Council of Australian Governments in July 2006.

The focus of The Living Murray is to recover water and implement works to achieve specific environmental outcomes for six Icon Sites along the River Murray. The six Icon Sites are:

- Barmah-Millewa Forest;
- Gunbower Koondrook-Perricoota;
- Hattah Lakes;
- Chowilla Floodplain (including Lindsay-Wallpolla);
- Murray Mouth, Coorong and Lower Lakes; and
- River Murray Channel.

This is the fourth report of the IAG in relation to The Living Murray.

Indicative volumetric targets for each jurisdiction are shown in Table E1, along with progress towards these targets. As of 30 June 2008, 133 GL of Environmental Water was listed on the Environmental Water Register. The volume listed on the Eligible Measures Register is 403.65 GL indicating that, if these measures are completed (and the recovered volumes progressed to the Environmental Water Register) during 2008–09 the target of 500 GL will be achieved by June 2009.

This is a substantial improvement on the position in June 2007.

Table E1: Total volumes of water as Long-term Cap Equivalents (GL) on the Environmental Water Register and the Eligible Measures Register for each jurisdiction as at 30 June 2008

	New South Wales	Victoria	South Australia	ACT	Aust. Gov't*	MDBA*	Total
Indicative Volumetric Target	249*	214*	35*	2	0	0	500
Volume on the Environmental Water Register – projects completed and accredited	0	120	13	0	0	0	133
Volume on Eligible Measures Register – projects that are implementation ready or being implemented	237.2	91	5	0	0.45	70	403.65
Developmental Register Recovery projects under development	0.68	0	0	0	0	20	20.68

* Water recovered under the Australian Government and MDBA market-based measures will be apportioned across state targets according to source of recover on completion of the measure.

In relation to investment in water recovery under The Living Murray, as at 30 June 2008, there are nine water recovery measures being implemented under signed investment agreements – the Goulburn Murray Water Recovery Package, the Pilot Environmental Water Purchase, Securing Government Held Water for Environmental Use, the Water Through Efficiency Tender, Package B, NSW Market Purchase Measure, Murray Irrigation Limited Supplementary Water Access Licence, the Shepparton Irrigation Area Modernisation and the Ricegrowers' Association On Farm Water Efficiency project A1.

Additionally, funds have been invested in The Living Murray to implement environmental works and measures (e.g. the construction of several fishways along the River Murray).

As in the past, this report is structured to broadly follow the sections of The Living Murray Business Plan relevant to the needs of the IAG. The IAG assessment focuses on issues identified and recommendations for their resolution.

Of the twenty nine recommendations made in the IAG's first three audit reports, ten were satisfactorily addressed and hence assessed as being completed prior to the 2007–08 audit. As shown in Annex 2, the 2007–08 audit has concluded that of the nineteen outstanding recommendations carried over from the first three audit reports eleven have been addressed and are considered as being completed, while progress has been made in relation to the other eight. These eight outstanding recommendations will be carried over and progress against them assessed in the 2008–09 audit report, along with the four new recommendations in this report.

During the 2007–08 audit process, four issues were identified by the IAG. A summary of each issue along with recommendations follow.

Recommendation 2008.01 Timing of Funding Availability

Some concern was expressed by jurisdictions about the timing of funding availability for water recovery investment, using the example of the inability of the Commonwealth to carryover uncommitted funds from 2007–08 into 2008–09.

This lack of flexibility was because the Dept of Finance and Deregulation (DoFD) was reducing expenditure to manage inflationary pressures and because it did not believe that the TLM funds would be expended in the 2008–09 year. While there was some concern that any unspent or carried over funds from the 2007–08 year may be lost from the Living Murray, the Commonwealth advised that it had carried funds into 2009/10 to prevent their being lost.

Nevertheless, this carry over of funds to 2009/10 limits the Commonwealth's ability to co-invest in measures being brought forward for investment in 2008–09. The *First Call* investment shares are based on a fraction of the total project costs (SA 65/700s [9.3%] Vic and NSW 115/700s [16.4%], ACT 5/700s [0.07%] and Commonwealth and MDBC 200/700s [28.6%]). For this sharing arrangement to be effective it depends on timely co-investment to deliver projects prior to the June 2009 deadline. Any inflexibility in the timing of funding may limit the extent of investment during 2008–09 and hence expedition of the program prior to the June 2009 deadline.

The IAG recommends that the timing of funding availability be reviewed and appropriate arrangements be developed to ensure sufficient flexibility to facilitate program expedition and co-investment expenditure for 2008–09, or that it be recognised that investment beyond the June 2009 deadline is likely to occur.

Recommendation 2008.02 Role and performance of the Environmental Watering Group (EWG)

The IAG believes that the deployment of the very scarce reserve of environmental water during 2007–08 has been carried out well and that the available evidence indicates a high level of efficacy. The EWG has proven to be an effective vehicle for collaborative assessment and management of TLM allocations, although yet to be tested under conditions of relative plenty (when water may be available for allocation to lower priority uses).

Much of the successful decision-making of the EWG is based on the expert judgement of its members and their advisers.

Whilst acknowledging this, the IAG recommends that the EWG be invited to document the steps followed in prioritising their response to competing demands for environmental water and the principles upon which these steps are based, as a template for making similar decisions across Jurisdictions on a Basin-wide scale.

Recommendation 2008.03 Impact of prioritisation of the Environmental Works and Measures Program (EWMP) on the use and effectiveness of the environmental water portfolio

The prioritisation of the EWMP, including delisting of a number of projects and possible changes to budgets and time-lines, will result in changes to TLM's capacity to allocate and deliver environmental water to some icon sites. There is a significant risk that this will alter the relative ecological value (or benefit) of water distributed amongst icon sites and, therefore, a need to assess the impact of these changes on the achievement of environmental objectives and the use of environmental water.

The IAG recommends that the MDBA TLM team assess the impacts of the EWMP prioritisation on the capacity to achieve the icon site environmental objectives and provide a report to the EWG and the IAG.

Recommendation 2008.04 Use of TLM water to redress effects of emergency management actions

During 2007–08 small allocations of TLM environmental water were diverted to avoid unforeseen environmental damage at sites at which water had previously been saved and diverted for other uses. Under the extreme circumstances prevailing, and with no acceptable alternatives immediately available, the EWG agreed to this allocation and their decision is endorsed by the IAG.

However, *the IAG recommends* that use of TLM environmental water in this way is an action of last resort and that water to redress unforeseen threats resulting from management actions be sourced by the responsible management authority.

1. INTRODUCTION

1.1 Background

On 25 June 2004, First Ministers of the Murray-Darling Basin Ministerial Council from New South Wales, Victoria, South Australia, the Australian Capital Territory, and the Australian Government signed the *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* ('the Intergovernmental Agreement').

On 1 April 2005, the Murray-Darling Basin Ministerial Council activated The Living Murray Business Plan ('the Business Plan'). The Business Plan provides a framework for the implementation of the actions under the Intergovernmental Agreement. It includes arrangements for investing \$500 million committed for the recovery of an estimated requirement of an average 500 GL per year of water by the New South Wales, Victorian, South Australian, ACT and Australian Governments. Further investment has also been provided through the Ministerial Council for the complementary Environmental Works and Measures Program which will provide improved health of the River Murray System including through the provision of increased operational flexibility in the delivery of recovered water.

In June 2006, the Australian Government invested an additional \$500 million in the activities of the Murray-Darling Basin Commission in large part to accelerate the delivery of The Living Murray. This included a further (notional) \$200 million for water recovery and additional investment in the Environmental Works and Measures Program. In July 2006, the Council of Australian Governments agreed to a Supplementary Intergovernmental Agreement setting out the arrangements associated with this additional funding. An updated version of the Business Plan was approved by the Murray-Darling Basin Ministerial Council on 25 May 2007 to reflect the evolution of the arrangements around The Living Murray.

The initial focus of The Living Murray is to recover water and implement works to achieve specific environmental outcomes for six Icon Sites along the River Murray. The six Icon Sites are:

- Barmah-Millewa Forest;
- Gunbower Koondrook-Perricoota;
- Hattah Lakes;

- Chowilla Floodplain (including Lindsay-Wallpolla);
- Murray Mouth, Coorong and Lower Lakes; and
- River Murray Channel.

The original set of specific environmental outcomes is at Annex 1.

Since 2005, the Independent Audit Group ('IAG') has audited progress in the implementation of the Living Murray at the same time as its annual audit of compliance to the Murray-Darling Basin Cap.

Between the end of the reporting period, June 2008, and the finalisation of this report the Murray Darling Basin Authority (MDBA) has come into existence, under new legislation, subsuming the role of the Murray Darling Basin Commission (MDBC). Except where it refers to past actions, mention of MDBC in this report should be interpreted as referring to MDBA.

1.2 Scope of and basis for the audit

This IAG audit is performed in accordance with the terms of reference from Clauses 203 and 204 of the Business Plan (2007), which are given below.

203. Auditing will be conducted to meet the requirements of Clause 78 of the Intergovernmental Agreement, which states that:

The following will be subject to annual external auditing to the satisfaction of the MDB Ministerial Council:

- i) *financial records of expenditure accredited against funding commitments under the Intergovernmental Agreement;*
- ii) *financial records of any temporary or permanent trade of recovered water;*
- iii) *registries of recovered water;*
- iv) *the environmental management of recovered water; and*
- v) *management of the impacts on the Long Term Diversion Cap which result from the recovery and delivery of water under the Intergovernmental Agreement.*

204. Auditing referred to in clause 203 will be undertaken by the Independent Audit Group established by clause 12 of Schedule F of the Murray-Darling Basin Agreement 1992, with the first audit due by 31 July 2005. The financial records kept by jurisdictions will be subject to their standard auditing practices, with the audit report provided to the MDB Ministerial Council.

Additionally, in February 2006, the Murray-Darling Basin Commission revised the Terms of Reference of the IAG to “*permit the provision of advice on any issues related to The Living Murray of which it becomes aware during the course of its annual audit.*”

1.3 This Report

This is the fourth report of the IAG on The Living Murray. The IAG report focuses on issues identified and recommendations for their resolution.

The first report “Review of The Living Murray Implementation 2004–05 – Report of the Independent Audit Group” identified twelve issues and made recommendations in relation to each issue. The second report “Review of The Living Murray Implementation 2005–06 – Report of the Independent Audit Group” identified eight issues and made recommendations in relation to each issue. The third report “Review of The

Living Murray Implementation 2006–07 – Report of the Independent Audit Group” identified nine issues and made recommendations in relation to each issue. Of the twenty nine recommendations made in the first three audit reports, ten were satisfactorily addressed and hence assessed as being completed prior to the 2007–08 audit. In line with the policy developed in the third audit report, the remaining nineteen recommendations are carried over and listed in Annex 2.

A summary of the status of progress in response to the nineteen outstanding recommendations from the previous three audit reports, based on information available for the October 2008 audit process, is also set out in Annex 2. The 2007–08 audit has concluded that eleven of the nineteen carried over recommendations have been addressed and are assessed as being completed. The remaining eight outstanding recommendations will be carried over and progress against them again assessed in the 2008–09 audit report, along with the new recommendations in this report.

The focus of this report is the 2007–08 year. To support the audit, partner governments provided information and participated in a meeting with the IAG. Information available to the IAG at the time of the audit is referred to as required to assist with consideration of matters relevant to The Living Murray implementation.

A glossary of terms is presented in Annex 4.

2. INVESTMENT AND WATER RECOVERY

2.1 Targets for Investment and Water Recovery

The indicative investment targets in the Business Plan, (clause 35) are given in Table 1.

Table 1: Indicative Investment Targets

State / Territory	State / Territory Contribution	Commonwealth Government Indicative Contribution	Murray-Darling Basin Commission Indicative Contribution
NSW	\$115m	\$100m	\$100m
Vic	\$115m	\$86m	\$86m
SA	\$65m	\$14m	\$14m
ACT	\$5m	-	-
Commonwealth			
Total	\$300m	\$200m	\$200m

The indicative water recovery targets in the Business Plan, (clause 40) are set out in Table 2. Water recovered associated with investment by the Commonwealth Government and the MDBC is to be recorded against the indicative volumetric target of the relevant jurisdiction.

Table 2: Indicative Water Recovery Targets (GL)

	New South Wales	Victoria	South Australia	Australian Capital Territory
Indicative Volumetric Target	249 GL	214 GL	35 GL	2 GL

2.2 Registers of Recovered Water

Under the Business Plan, the establishment and maintenance of three central registers is required. These registers are to be kept by the MDBC Office and are:

- the Developmental Register¹, which lists water recovery measures in an early stage of development;
- the Eligible Measures Register², which comprises measures, with associated Investment Agreements, approved by Ministerial Council; and
- the Environmental Water Register³, which records water entitlements and related information once the associated measure has been implemented, a post-implementation review completed and MDBMC approval obtained.

Environmental water registers are to be maintained in the state or territory in which the water is recovered and at an aggregated scale by the MDBC Office.

Clause 157 of the Business Plan sets out the water entitlement and related information which are to be recorded in these registers. This information includes:

- Source of water recovered;
- Estimated average volume delivered to the River Murray channel;
- Associated Cap impact in tributaries where relevant;
- Security and reliability characteristics;
- Channel capacity sharing characteristics;
- Type of water recovered (regulated or unregulated);

¹ Refer to clause 24 of the Intergovernmental Agreement

² Refer to clause 24 of the Intergovernmental Agreement and clauses 69 to 71 of the Business Plan

³ Refer to clause 156 of the Business Plan

- Storage / call location(s) if regulated water;
- Geographic limitations on its application to the six Icon Sites; and
- Trading of environmental water where appropriate.

The content of the central register is prescribed in “Guidelines for water recovery in the Living Murray (April 2008)”, which have been approved by the MDBC and are publicly available on the MDBC website.

As required under the Business Plan, an independent review is carried out on each proposal for listing on the Eligible Measures Register and the Environmental Water Register

Water recovery progress to the end of June 2008, expressed in Gigalitres of Long-term Cap Equivalents, is summarised in Table 3 for each of the three Registers. Indicative targets are provided for comparison but it should be noted that water recovered through market-based measures by MDBA and the Australian Government will be redistributed across the jurisdictional registers according to the State from which it was obtained.

2.3 Overall Performance Against Targets

The performance against the indicative targets should be considered in the context that the most important targets are that:

- an estimated average of 500 GL/year is to be recovered.
- an investment of \$500m (plus a notional \$200m from the Supplementary Intergovernmental Agreement) is to be made.

Clause 32 and 33 of the Living Murray Business Plan calls for the establishment of indicative annual investment targets for expenditure of the \$500 million commitment. These annual targets have not been established in practice.

MDBA has provided estimates of cumulative investment to 30 June 2008 based on available schedules at the time. Information on approval and payment of individual milestones is not available. The data are presented in Table 4.

Table 3: Summary of total volumes on registers as at 30 June 2008

Proponent	Volume on the Developmental Register* (GL LTCE)	Volume on the Eligible Measures Register* (GL LTCE)	Volume on the Environmental Water Register (GL LTCE)	Indicative Target (GL LTCE)
Australian Government	0	0.45	0	0**
New South Wales	0.677	237.2	0	249
Victoria	0	91	120	214
South Australia	0	5	13	35
ACT	0	0	0	2
MDBC	20	70	0	0**
TOTAL	20.677	403.65	133	500

* Note: Some water recovery measures listed on the Developmental Register or Eligible Measures Register, and included in this table, may not be implemented completely, or at all.

** Zero target as water recovered under the Australian Government and MDBA market-based measures will be apportioned across state targets according to source of recover on completion of the measure.

Table 4: Actual investments under Investment Agreements against targets set out in Business Plan

Jurisdiction	Indicative targets	Cumulative accredited investment to June 2008	Cumulative investment under schedules to June 2008
Australian Government	\$200m	\$5.58m	\$82.69m
New South Wales	\$115m	\$3.21m	\$57.82m
Victoria	\$115m	\$3.21m	\$54.19m
South Australia	\$65m	\$1.95m	\$13.43m
Murray-Darling Basin Commission	\$200m	\$5.58m	\$39.90m
Australian Capital Territory	\$5m	\$0m	\$0m

Table 3 summarises progress in water recovery against the indicative water recovery targets in the Business Plan. It compares the listings on the three registers, Developmental, Eligible Measures and Environmental Water, against indicative (total) targets. It should be noted that volumes on the Developmental Register and, to some extent, on the Eligible Measures Register are best estimates and that some measures may not be implemented completely in the future.

Table 4 provides complementary data on the investments made in reaching these targets in relation to the Business Plan.

2.4 Water Recovery - Progress at a program scale

New South Wales has taken significant steps towards achieving its volumetric target. South Australia has progressed substantial measures to the Environmental Water Register. Each of these States has developed water recovery strategies designed to achieve its volumetric targets. Both State strategies include the implementation of market-based measures of significant magnitude in the context of their targets.

As at 30 June 2008, with the progression of the Shepparton Irrigation Modernisation Project from the Developmental Register to the Eligible Measures Register, Victoria is nearing its indicative volumetric target.

The MDBA is supporting progress by jurisdictions towards targets by continuing to fund feasibility assessments, convening the Water Recovery Working Group, and as the proponent of water recovery measures.

As at 30 June 2008, there are nine water recovery measures being implemented under signed investment agreements – the Goulburn Murray Water Recovery Package, the Pilot Environmental Water Purchase, Securing Government Held Water for Environmental Use, the Water Through Efficiency Tender, Package B, NSW Market Purchase Measure, Murray Irrigation Limited Supplementary Water Access Licence, the Shepparton Irrigation Area Modernisation and the Ricegrowers' Association On-farm Water Efficiency project A1.

A significant development in 2007–08 has been the proposal for listing of a broader range of water recovery measures, including market-based and on-farm activities. It is also noteworthy that several of these measures have been proposed by entities that do not have indicative volumetric targets (eg. measures have been proposed by the Ricegrowers' Association of Australia, the Australian Government, and the MDBC).

2.4.1 Australian Government

2007–08 Activities

In 2007–08 financial year the Australian Government continued to implement the Investment Agreement as the Proponent for the Australian Government's *Water Through Efficiency Request for Tenders* measure and entered into five new investment agreements as an Investor. Prior to July 2007 the Australian Government had committed \$37.2 million to Living Murray Projects, of which \$15.162 million had been expensed. During 2007–08 the Australian Government committed a further \$112.602 million bringing the total commitment as of 30 June 2008 to \$149.802 million.

Actual expenditure by the Australian Government during 2007–08 was \$67 million bringing the total expenditure to \$82.69 million. The Australian Government also finalised the *Water Through Efficiency Request For Tender* measure.

Proposed Activities 2008–09

The Australian Government does not intend to propose any new water recovery measures through The Living Murray initiative in the 2008–09 financial year, but will meet its commitments to any projects where it is a signatory to an Investment Agreement.

The Australian Government has yet to commit \$50.198 million of its \$200 million expenditure target. These funds will be used to invest in high priority Living Murray projects.

2.4.2 New South Wales

2007–08 activities

Development of the Darling Anabranch Pipeline continued in drought mode. Further work on this component continued on in-stream infrastructure, on-farms works and legal matters concerning handover and establishment of the sinking fund.

The *NSW Package B* measure continued to be progressed during 2007–08. The Edwards River project component was added to the Package and the Koraleigh component was removed. The Investment Schedules were signed and initial investment contributions received.

The Murray Irrigation Limited (MIL) Supplementary Access Licence Water measure was progressed with purchase completed, Investment Schedules signed and investment received for completion of Milestones 1 & 2.

Feasibility and development stage studies continued for potential measures for the Coobool, Lake Tooim, Mid-Murray Wetlands, Upper Murray Wetlands, Abercrombie, Coleambally and 'Small Irrigation Trusts' projects.

The Euston Lakes Regulators, Lower Murray Darling Wetlands and Lower Darling Anabranch projects were significantly delayed due to drought-related issues.

The Koraleigh, Lake Moira, Hi-Tech Meters projects and Edwards River Stage 2 & 3 are no longer classified as TLM projects because they are being further advanced under other programs.

The *New South Wales Market Purchase* measure was commenced in April 2008

Proposed Activities 2008–09

The following activities are planned for 2008–09:-

The Murray Irrigation Limited (MIL) Supplementary Access Licence Water - following gazettal of amendments to Murray and Lower Murray Water Sharing Plan, application to be made to have 17.8 GL LTCE placed on the Environmental Water Register. Achievement of all milestones in Investment Agreement and finalisation of investment with participating jurisdictions.

Poon Boon Component of NSW Package B - Achievement of all milestones in Investment Agreement and finalise investment with participating jurisdictions. Make application to have 9 GL LTCE placed on the Environmental Water Register.

Edwards River - Application lodged to have 7 GL LTCE placed on the Environmental Water Register.

Anabranch Project - Finalisation of legal instruments for handover to Anabranch Water, creation of Water Access Licence and amendment to Water Sharing Plan. Achievement of all milestones in Investment Agreement and finalisation of investment with participating jurisdictions. Make application to have 47 GL LTCE placed on the Environmental Water Register.

NSW Market Purchase measure - The current program aims to purchase water entitlements in 2008–09 with the potential for the measure continuing into 2009/10 subject to carry-over of funds from investors. If purchases continue at the current rate it may be possible to complete the program in the current financial year. Application will be made to have water placed on the interim Environmental Water Register as purchases are completed.

Feasibility and Developmental Phase Projects - Investigative work will continue on eight projects although they may not be

completed under The Living Murray program. The intention is, as a minimum, to bring projects to an 'investment-ready' stage by June 2009 for possible implementation under the "Water for the Future" program. The projects are:

- Coobool
- Mid - Murray Wetlands
- Euston Lakes
- Abercrombie
- Coleambally Stock Water
- Romani
- Lower Murray/Lower Anabranch Wetlands
- Small Irrigation Trusts (West Cadell)

2.4.3 Victoria

2007–08 Activities

The following activities were undertaken or completed during the 2007–08 financial year for the three measures listed on the central register.

Goulburn-Murray Water Recovery Package

Milestones 11 and 12 relating to reconfiguration works were completed. The reconfiguration works are a component of the package that will deliver 25 GL of high-reliability water entitlement to the Living Murray Initiative. The reconfiguration works involve the development of pilot reconfiguration plans for irrigation distribution systems. These plans form the basis of further investment in upgrading and rationalising irrigation distribution infrastructure.

Following agreement of the Investor Board, payments were made to Goulburn-Murray Water and invested contributions were received by Victoria against Milestone 11 and 12 in accordance with the Investment Agreement.

Lake Mokoan Water Recovery Package

This measure will recover water for both the Living Murray and the Snowy Initiative.

Implementation of this measure was delayed by the need for an alternative proposal to be evaluated. It was agreed that the initial listing of the measure on the Eligible Measures Register be

withdrawn. An updated measure was listed during 2007–08 with progress of the five components being as follows:

- The design of the pipeline to provide alternative supply to Lake Mokoan diverters was completed and preparations for construction progressed;
- Stage 1 works construction for a mid-Murray Storage have commenced, including installation of new flow control gates;
- negotiations in relation to finalising "offset" measures continued;
- future drainage arrangements for the inlet channel as part of asset decommissioning were finalised; and
- funding was announced to facilitate rehabilitation of the Winton Wetlands.

Investor contributions from other jurisdictions are not yet finalised.

Shepparton Irrigation Area Modernisation Project

This measure was approved for listing on the Eligible Measures Register in October 2007.

During 2007–08 the first four milestones relating to establishment, agreement on the scope of works and execution of the Investment Schedule were completed and progress payments to Goulburn Murray Water were made as per the funding deed.

Proposed activities 2008–09

The following activities are planned for the 2008–09 financial year.

Goulburn-Murray Water Recovery Package

Phase 3 and 4 of the reconfiguration program will be completed during 2008–09 (Milestones 13 and 14) and payments made according to the Investment Schedule. Contributions will be sought from investors subject to satisfactory completion of these milestones. The application to transfer the 25 GL of water from Goulburn-Murray Water will be received and the Victorian Government will apply to the Minister for Water to amend the relevant entitlements to secure the water for the Living Murray by 30 June 2009.

Lake Mokoan Water Recovery Package

The level of investment with other jurisdictions is to be confirmed and the components progressed as follows:

- Provision of alternative supply - the construction and commissioning of the pipeline to supply Lake Mokoan diverters is scheduled to be completed for January 2009.
- Construction of a mid-Murray storage - Stage 1 works are due to be completed in late 2008. The design of Stage 2 works will be finalised in early 2009, following the results of a study into the feasibility of decommissioning Little Murray Weir.
- Implementation of “offset” measures - the final package of “offset” measures is to be confirmed in October 2008.
- Asset decommissioning - the design of asset decommissioning is scheduled for completion in late 2008.
- Rehabilitation of the site - governance arrangements for implementation of the Future Land Use Strategy are to be formulated.

Shepparton Irrigation Area Modernisation Project

Sub-project 2 of the Shepparton Irrigation Area Modernisation project will be completed during 2008–09 (Milestones F, G, H and I) and payments made according to the Investment Agreements. These milestones comprise the bulk of the modernisation works, including; automation of 530 gates, replacement of 140 meters and reconfiguration of 34km of channel. Subject to satisfactory completion of these milestones, contributions will be sought from investors.

The application to transfer 30 GL of water from Goulburn-Murray Water will be received and the Victorian Government will apply to the Minister for Water Environment and Climate Change to amend the relevant entitlements to secure the water for the Living Murray by 30 June 2009.

2.4.4 South Australia

2007–08 activities

In 2007–08 South Australia the key activities were as follows:

Securing Government Owned Water For Environmental Use

Final crediting amounts were approved for listing on the Environmental Water Register in March 2008 making South Australia the first jurisdiction to achieve this.

Purchase from Willing Sellers Stage 1

South Australia’s Purchase from Willing Sellers Stage 1 (5GL) water recovery project was approved for listing on the Eligible Measures Register in May 2008. In June 2008 Investment Schedules were also distributed for signing to New South Wales, Victoria and the Murray-Darling Basin Commission as those parties indicated a willingness to invest.

Evaporation Savings from Wetlands

With the continuing drought and the emergence of significant areas of acid-sulphate soils a review of this measure was commenced. Savings at Wetlands from Evapotranspiration daily Time-Series Modelling at selected sites was initiated to provide an estimation of the likely savings available.

Securing Government Held Water and Purchase from Willing Sellers

The remaining 15GL of South Australia’s water recovery target will be made up from continued purchase of water entitlements from willing sellers and from securing additional water owned by government (if required). This measure was developed and noted by South Australian Cabinet in June 2008. This measure may be increased to recover a total of 17GL should the wetland savings measure not progress.

Proposed Activities 2008–09

In 2008–09, South Australia plans to complete the recovery of 35GL for The Living Murray. To achieve this, it will continue to purchase water from willing sellers to finalise both the Purchase from Willing Sellers Stage 1 and Securing Government

Held Water and Purchase from Willing Sellers. A decision will be made in regard to furthering the Evaporative Savings from River Murray Wetlands measure in light of the threat from developing acid sulphate soils. Should the measure be curtailed, increased purchases from willing sellers will be required.

An application to list South Australia's Securing Government Held Water and Purchase from Willing Sellers measure on the Eligible Measures Register will be prepared and Expressions of Interest to invest will be invited. Following this, it is expected that South Australia will be able to fully deliver planned water recovery measures by June 2009.

South Australia will formally sign an investment schedule committing around \$5.6 million to the NSW Package "B" water recovery measure.

South Australia will continue to invest in measures with signed Investment Schedules and consider new measures as they come forward for investment. South Australia will also play an active role in the relevant Investor Boards to provide due diligence to state investment

2.4.5 Australian Capital Territory

2007–08 activities

The ACT has not indicated an intention to invest in measures put forward by other states, preferring to invest within its own jurisdiction. As at 30 June 2008 no ACT water recovery measures were listed on any of the central registers. Activities undertaken in 2007–08 which may prove relevant to TLM in the future related to interstate water trading by ACTEW and permanent water conservation measures.

Proposed Activities 2008–09

The ACT intends to propose to the Water Recovery Working Group that its indicative volumetric target of 2GL, will be met via the purchase of water entitlement from downstream in the Murrumbidgee System by ACTEW for the purpose of increasing water supply security. It will further propose that its \$5M investment target is to be met through expenditure related to conservation measures in external water use.

2.4.6 Murray Darling Basin Commission

2007/2008 activities

Consistent with the Living Murray Business Plan, the MDBC is responsible for maintaining the Central Register of water recovery measures as well as managing the listing process. The following activities were undertaken or completed by the MDBC during the 2007–08 financial year in relation to four measures listed on the Central Register.

Pilot Market Purchase Measure

This measure involved the purchase of high and medium reliability entitlements from within the southern connected part of the Basin with a target of 20 GL. All purchases were made in accordance with safeguards for purchase of water entitlement in the market. Purchases were made on a weekly basis, with the pilot period planned to run from 16 July 2007 until 28 September 2007. However following a significant response, the pilot period closed on the 13 August 2007. The conveyancing process for the transfer of entitlement for the measure is proceeding.

As at 30 June 2008, an interim listing for 12.9 GL (LTCE) on the Environmental Water Register is being considered.

Environmental Water Purchase Project

Following the successful implementation of the Pilot Market Purchase Measure, a second market-based measure was listed on the Eligible Measures Register in October 2007. This project aims to purchase up to 50 GL of high and medium reliability water entitlements from the southern connected Murray Darling Basin. Commencement and running dates have not yet been finalised for this measure.

Ricegrowers' Association of Australia On-farm Water Efficiency Project A1

The Ricegrowers Association of Australia (RGA) brought forward a water recovery measure involving a large number of small projects which improve water use efficiency on farms. It was listed on the Eligible Measures Register in September 2007. This measure aims to recover up to 2.5 GL of general security water entitlements from the rice growing regions of the NSW Murray and Murrumbidgee valleys.

Ricegrowers' Association of Australia On-farm Water Efficiency Project: Round 2

This project was listed on the Eligible Measures Register in May 2008. The project involves implementing a second round of the on-farm water efficiency project. Based on the interest received during the first water efficiency project, round 2 seeks to recover up to 10 GL of water for The Living Murray.

Proposed activities 2008–09

The following activities are planned for the 2008–09 financial year:

Pilot Market Purchase Measure

It is planned that the final water entitlements will be transferred to the MDBC and the measure will be listed in full on the Environmental Water Register.

Environmental Water Purchase Project

Expressions of interest will be sent to jurisdictions to invest in this measure and investment schedules will be executed. The measure will use the same principles of purchasing that were applied in the Pilot Market Purchase Measure.

Ricegrowers' Association of Australia On-farm Water Efficiency Project A1 & Round 2

Investment schedules have been developed for the RGA A1 project and the measure is progressing with the conveyance process due to begin early in the 2008–09 financial year. The final composition of the Round 2 project is currently being finalised and is expected to be completed prior to June 30 2009.

The MDBC will also continue to invest in measures with signed investment schedules and will consider further investment in new measures as they come forward.

2.5 IAG Assessment**2.5.1 Overview**

Considerable progress has been made in regard to water recovery for The Living Murray in 2007–08. A range of measures is being developed and proposed by a number of proponents. Substantial additional work still remains to be completed, however, and significant effort will be required to meet the target of 500 GL by June 2009.

The acceleration in the development of water recovery programs observed during the past year will need to continue if the June 2009 target is to be approached.

2.5.2 Issues Identified and Recommendations**Recommendation 2008.01 Timing of Funding Availability**

Some concern was expressed by jurisdictions about the timing of funding availability for water recovery investment, using the example of the inability of the Commonwealth to carryover uncommitted funds from 2007–08 into 2008–09. This lack of flexibility was because the Dept of Finance and Deregulation (DoFD) was reducing expenditure to manage inflationary pressures and because it did not believe that the TLM funds would be expended in the 2008–09 year. While there was some concern that any unspent or carried over funds from the 2007–08 year may be lost from the Living Murray, the Commonwealth advised that it had carried funds into 2009/10 to prevent their being lost.

Nevertheless, this carry over of funds to 2009/10 limits the Commonwealth's ability to co-invest in measures being brought forward for investment in 2008–09. The *First Call* investment shares are based on a fraction of the total project costs (SA 65/700s [9.3%] Vic and NSW 115/700s [16.4%], ACT 5/700s [0.07%] and Commonwealth and MDBC 200/700s [28.6%]). For this sharing arrangement to be effective it depends on timely co-investment to deliver projects prior to the June 2009 deadline. Any inflexibility in the timing of funding may limit the extent of investment during 2008–09 and hence expedition of the program prior to the June 2009 deadline.

The IAG recommends that the timing of funding availability be reviewed and appropriate arrangements be developed to ensure sufficient flexibility to facilitate program expedition and co-investment expenditure for 2008–09, or that it be recognised that investment beyond the June 2009 deadline is likely to occur.

3. ENVIRONMENTAL MANAGEMENT ACTIVITIES 2007–08

3.1 Introduction

The Living Murray Business Plan 2007 commits the MDBC to apply the available recovered water in a way that maximises ecological outcomes across the six Icon Sites and achieves other environmental objectives as agreed by all parties to the Intergovernmental Agreement.

The Living Murray Initiative seeks to achieve its objectives through the timely delivery of water allocated for the purpose and through a program of works and measures aimed at optimising that delivery and supporting other ecological processes in the Murray system.

3.2 Availability of Environmental Water

Information on projects listed on the MDBC central register of water recovery measures is summarised in Table 3 and is also available from the MDBC website. The data show that, as at 30 June 2007, 13 GL of water was listed under the Securing Government Owned Water for Environmental Use measure and 120 GL has been agreed as an interim listing for the Goulburn Murray water recovery package.

The volume of environmental water made available for use in 2007–08 totalled 16.96 GL (see Table 5) of which:

- 12.8 GL RMIF was carried over from 2006–07 from water efficiency saving projects made by Victoria and New South Wales in relation to the Snowy Scheme; and,
- 4.16 GL was provided from South Australia (based on South Australia's 32% allocation)

At the end of the 2007–08 Water year 16.522 GL had been used for watering. This left 0.438 GL unused to be carried over to 2008–09.

3.3 Trade in Recovered Water

The Living Murray Business Plan 2007 indicates that water recovered for the environment and held as a tradeable entitlement may be traded on the temporary market at times when this is consistent with the Living Murray Environmental Watering Plan. To ensure tradability, environmental entitlements will need to have the same characteristics as other tradeable entitlements. Schedule H to The Living Murray Business Plan indicates that existing rules for water trade including processes for what Cap adjustments apply.

Table 5: Summary of Entitlements and Allocations for 2007–08

Product	Entitlement (GL)	Reliability	Available Environmental Allocation (GL) for 2007–08	
TLM Water	Victoria – Goulburn Murray Water Package – Part A (interim listing)	120	Low	0
	SA Securing Government held water for environmental use	13	High	4.16 (based on SA's 32% allocation)
RMIF	Annual volume advised by 30 April each year	Low*	12.8 (carryover from 2006-07)	
BMF EWA**	100	High	0	
	50	Low		
TOTAL			16.96	

* The delivery of RMIF from the Snowy makes reliability low.

**This entitlement is managed by NSW and VIC in accordance with the BMF EWA operating rules and contributes to achieving the icon site objectives for the Barmah-Millewa Icon Site

There was no trade of water listed on the Environmental Water Register or any other water available for environmental use under The Living Murray initiative during 2007–08.

3.4 Environmental Works and Measures

The Living Murray Environmental Works and Measures Program aims to improve the health of the River Murray system by funding infrastructure that delivers and manages water at the six icon sites and supports ecological processes aimed at achieving the environmental objectives of the Ministerial Council's First Step Decision. The infrastructure includes water regulating structures, water delivery channels and fishways as well as complementary works and measures.

The program commenced in 2003 and has a total budget of \$270 million. Expenditure under the program in 2007–08 was \$13.71 million

The Program highlights are:

- Significant progress on the Sea to Hume Fishways

The Lock 1 fishway has been completed, construction of the Lock 3 fishway has begun, and detailed designs for fishways at Locks 2, 4, 5 and 6 have been prepared. Once these works are completed, Lock 11 (associated with Mildura weir) will be the only weir along the Murray River without a fishway. The future reconstruction or replacement of Lock 11 is being considered and plans for a temporary fishway, which will operate until the lock is replaced, are being prepared.
- Progress on the conceptual designs for the key floodplain inundation projects

Detailed design is under way for works at Mulcra and Chowilla. Koondrook, Gunbower and Hattah lakes works are in the conceptual design stage. Construction is expected to begin in 2009/10.
- Interim blueprints and definition of the proposed landscape-scale works at icon sites completed.

Interim blueprints that describe landscape-scale plans to flood up to 40,000 ha of wetlands and floodplains have been defined

for the Gunbower–Koondrook–Perricoota; Hattah Lakes; and Chowilla, Lindsay and Wallpolla Icon Sites. These plans involve innovative engineering solutions; their development has required complex hydrologic, hydraulic and ecosystem modelling. Significant progress has been made over 2007–08 to refine these proposals and model the associated water scenarios and TLM appears well placed to finalise and communicate the blueprints in 2008–09 leading to a revision of the Environmental Management Plans for each site.

- Completion of the first stage of hydrological modelling to determine if and how the water requirements associated with the proposed works can be met.

Stage 1 of the modelling program was completed in June 2008. Stage 2, which will indicate whether the works can operate with the available TLM water, is due for completion by October 2008. Stage 1 of the modelling established a robust platform to support the modelling and optimisation of water application using the proposed infrastructure.

- A cost and scheduling review, the first component of the EWMP mid-term review, completed.

A cost and scheduling review was undertaken in early 2008. This showed that the EWMP had a total estimated cost of approximately \$500M and would take until 2013 to complete. The review instigated a prioritisation process, to bring the program back into alignment with the available budget of \$270M. The prioritisation process resulted in the identification of six major on-going priority projects with an approximate total cost of \$240M: the Sea to Hume Fishways (including Edwards River) and five floodplain inundation works at Chowilla, Mulcra, Hattah, Koondrook – Perricoota, and Gunbower. The prioritisation process delisted some projects from the EWMP funding package.

3.5 Planning for Water Application

Water application is managed through Icon Site environmental management plans (EMPs) coordinated through the Living Murray

Environmental Watering Plan (LMEWP).

The LMEWP approved by Ministerial Council at Meeting 41 (29 September 2006) was not revised for 2007–08 pending finalisation of TLM blueprints, the EWMP prioritisation and TLM hydrologic modelling. This is scheduled for completion in 2009.

The Environmental Watering Group (EWG) was established under Clause 133 of The Living Murray Business Plan 2007 to develop the LMEWP and the River Murray Channel Environmental Management Plan. It also assesses and prioritises individual Icon Site EMPs in relation to the LMEWP, evaluates proposals for works and measures projects, and advises the Commission of its conclusions.

3.6 Water Application Activities

The Environmental Watering Group applied a water prioritisation process to determine the 2007–08 environmental watering priorities as there was insufficient water to meet all of the icon site demands. Due to the continued drought conditions, watering proposals were required to meet at least one of the following principles endorsed by the MDBC:

- sustain small, critical refuge areas for native plants and animals
- maintain critical connectivity between sites
- protect previous investments in environmental watering.

Eligible actions were then scored in terms of their applicability to the following criteria:

- criticality (i.e. the consequences of not acting)
- environmental benefit (in terms of the stated objectives for each site)
- opportunity (i.e. the capacity to take advantage of other events).

This process resulted in a list of 16 critical environmental watering actions across the icon sites. These were prioritised in order of those that scored highest to lowest against the criteria. These actions required a total of ~70 GL to be provided, which was greater than the 12.8 GL of water available at the time.

The MDBC at Meeting 93 – 4 September 2007 agreed to this list of 2007–08 TLM environmental watering priorities. The first 4 watering priorities accounted for the 12.8 GL. Successive actions on the list provided the scope for additional watering if water availability increased.

By late 2007, it was apparent that due to the deepening drought it was not feasible to implement the majority of watering actions approved by MDBC93. Meanwhile, new priorities were emerging due to the unprecedented extreme dry conditions. In response, the EWG reviewed the approved actions and considered additional actions in an expanded TLM geographic scope that included the Murray River Channel icon site and key areas of the Murray River system which have a material influence on achieving the objectives of the icon sites.

The EWG was guided by the following drought objectives in determining the relative priority of the extreme dry watering proposals put forward by jurisdictions:

- avoid critical loss of threatened species
- avoid irretrievable damage or catastrophic events
- provide drought refugia to allow recolonisation following drought.

Through this process, a new set of environmental watering priorities for 2007–08 were approved by the MDBC (OoS 153 - 19 December 2007). The revised priorities included actions for immediate implementation and additional actions that could be re-prioritised and elevated to implementation status throughout the season, pending water availability and the approval process. The delegation approved by MDBC at Meeting 92 provided a mechanism for the timely approval of the implementation of watering actions:

The Commission agreed “... *that the Chief Executive and General Manager Natural Resources be delegated responsibility to make decisions regarding re-distribution of environmental water between actions within a season at the Icon Sites on the advice of the Environmental Watering Group.*”

Commission approval was sought for watering actions outside the scope of this delegation including for Banrock Station wetland (MDBC OoS 157 – 24 April 2008).

3.6.1 Special Issues 2007–08. Lower Lakes and Coorong

Significant risk of rapid and irreversible degradation in the Lower Lakes (an icon site) resulted in a response outside the TLM commitments.

Reduced freshwater flows into the Lower Lakes have been exacerbated by the ongoing drought. In March this year, it became evident that the falling lake levels were resulting in an increased exposure of acid sulphate soils, and consequently an increased risk of acidification of water and sediments.

In response to this situation, Ministerial Council in March 2008 approved the Lake Albert Water Level Management project at a budget of \$6m. A temporary structure has been built to separate the Lakes and pumping from Lake Alexandrina to Lake Albert commenced on 2 May 2008. This pumping is to ensure that no further sulphidic sediments are exposed, preventing further acidification of Lake Albert.

The Ministerial Council 44 (7 March 2008) directed the Murray–Darling Basin Commission to develop risk management strategies and future management options for the Coorong and Lower Lakes and to report to Council in October 2008. A number of inter-jurisdictional workshops have contributed to the development of these options. Progress is broadly summarized below.

Short Term Management Options

Ministerial Council has agreed to the following short term (defined as the next 6–24 months) management objectives:

- Avoid irreversible damage, especially acidification of Lakes System (Lakes Alexandrina and Albert, tributaries and other fringing areas).
- Actions taken must not adversely impact on water quality for major water supply off-takes.
- As far as possible, actions must not compromise long-term options.

In order to achieve these short term management objectives, critical acidification thresholds and water level management triggers have been developed by South Australian agencies based on the best available scientific advice.

As the situation is unprecedented it is necessary to update these triggers and the models that support them as new data come to hand.

A draft real time management strategy for 2008–09 was considered at Commission meeting 96 (26 August 2008) and is now being considered by Ministerial Council. The feasibility of bioremediation alternative management options including the addition of acid neutralising materials (eg: microfine limestone) to exposed sediments and the water column, augmented natural bioremediation (sulphate reducing bacteria) and establishment of vegetation (eg: lake bed cropping) are currently being assessed.

Longer Term Management Options

The longer term options identified for further analysis broadly fall into three scenarios:

- A freshwater Lakes system
- A variable Lakes system (fresh with occasional estuarine influences at low flow)
- A marine/estuarine Lake system

These scenarios will be developed in the light of long term water availability, climate change, and sea level rise forecasts. Potential risks with pursuing each of these scenarios need to be identified and assessed. This includes the impact of seawater on environmental (including acid sulphate soils), economic and social values should an estuarine/marine system be seen as a possible future. The first report on the development of the longer term options is expected to be provided to Commission and Council in early 2009.

3.7 Environmental Response to Watering Activities

The unprecedented drought conditions during the past seven years have contributed to a general decline in the flora and fauna across the Murray Darling Basin region, including the Living Murray Icon Sites. The continued low inflows into the

Murray River during 2007–08 resulted in small volumes of water available for management under The Living Murray environmental watering framework. It was necessary to seek opportunities for TLM watering to build upon and complement other water management and environmental entitlements to maximise environmental outcomes and achieve multiple benefits. In order to utilise this small volume effectively, environmental watering in 2007–08 was targeted to the most critical areas within icon sites based on the following principles:

- avoid critical loss of threatened species
- avoid irretrievable damage or catastrophic events
- provide refugia to allow recolonisation following drought

The 16.522 GL of environmental water used for watering icon sites in 2007–08 is less than 4% of the 500GL to be recovered under the Living Murray Initiative⁴. Details of the application of this water during 2007–08 are presented in Table 5.

While very good localised environmental benefits were observed, the health of all but a small area of many icon sites is continuing to decline. The condition of the icon sites was described as follows⁵:

- (f) Across the system, severe drought conditions continue to impact on waterbird communities and limit the availability of other wetland, floodplain and riverine habitats throughout the southern Murray-Darling basin. Most floodplain or shallow Icon sites were dry or almost dry and supported few waterbirds. The main river channel had relatively few birds and low species richness.
- (g) River Red Gums and Black Box continued to decline across all Icon sites and understorey vegetation is in decline with a loss of biodiversity.

- (h) The overall river condition for fish communities, as reported by SRA for the 2004–2007 period, indicated a poor fish population (assessed by a deviation from the Reference Condition). However, new fishways are restoring passage for the migratory fish community and a major resnagging program has increased the available habitat for large-bodied species between Lake Hume and Yarrawonga.
- (i) At sites where some environmental water has been applied there have been positive responses including River Red Gum condition, ephemeral plant assemblages and fish and frog recruitment, however these are limited in extent.

Outcomes from the 2007–08 individual environmental watering are summarised below. Further detail is available in the Annual Environmental Watering Report and The Living Murray Icon Site Condition Report October 2008.

3.7.1 TLM Sites

Millewa permanent wetlands

In order to maintain critical refuge for southern pygmy perch, in January 2008 125 ML of environmental water was delivered into Toupna Creek via the Mary Ada regulator and directed to selected pools. Approximately 7 km of the creek received environmental water, resulting in an immediate increase in water levels and water quality.

Gunbower wetlands

7.7 GL of environmental water, including 5.7 GL of the Victorian flora and fauna entitlement, was used this year to fill 1100 ha of wetlands and provide drought refuge for colonial waterbirds, fish and frogs. This water was delivered from Gunbower Creek via the Yarran and Little Gunbower regulators, the latter built as part of The Living Murray program, and were utilised for the first time.

⁴ Only the SA water will contribute to the 500GL TLM target, the RMIF is a separate allocation outside of TLM.

⁵ see Icon Site Condition Report October 2008, http://www.thelivingmurray.mdbc.gov.au/publications/__data/page/1327/2008_Icon_Site_Condition_Monitoring_Report.pdf

Fish surveys recorded five species of native fish to date, including unspotted hardyhead and crimson-spotted rainbowfish. Six species of frogs have been recorded and tadpoles have been collected, demonstrating that breeding occurred. Two species of turtles have also bred; the eastern long-necked turtle and the endangered broad-shelled turtle. Waterbirds are increasing in number, including several species of ducks and small numbers of colonial waterbirds.

The spotted grass blue butterfly, which has not been recorded in Victoria for 15 years, was reported from Gunbower Forest just prior to the watering event. This species feeds exclusively on one species of wetland plant, hairy carpet-weed, which has increased in abundance since the inundation.

Lindsay-Wallpolla islands

7 GL of environmental water, including 3 GL of the Victorian flora and fauna entitlement, was delivered in late autumn 2008 to benefit highly stressed river red gums and to provide drought refuge for associated fauna in the Lindsay-Wallpolla region.

River red gum condition surveys have been undertaken at least once every year between 2004 and 2008 at Lindsay-Wallpolla Islands. The results show that trees watered previously remain in better condition than those not watered, but begin to deteriorate after 12 months of no watering. The results of the 2007–08 watering will be assessed in November 2008 and will be compared to the March 2008 assessment. However, visual assessments already indicate a very good response in terms of new leaf growth.

Large numbers of waterbirds are now present on watered sites. These include the Australian Shoveler, Hardhead and Great Egrets, which are all listed as vulnerable in Victoria. Other birds including Australian Grebes, Black Ducks, Teal and Black Swans have been breeding. Frogs are also responding. In the early stages of watering Peron's tree frog, the spotted marsh frog and plains froglets were all present.

Chowilla Floodplain

In the period January to April 2008, 4 previously watered sites (during 2004 and 2006) received 2.3 GL of environmental water to maintain river

red gums and other vegetation communities, as well as provide critical drought refuge for a range of animal species.

The scientific monitoring programme has shown that between 93% and 98% of monitored river red gums have responded positively to this watering. Between 2005 and 2008, the number of healthy trees at sites that have received environmental water on three occasions has remained stable, while at unwatered monitoring sites the number of healthy trees has declined by 24% (SA MDB NRM Board 2008).

The fauna of the Chowilla floodplain has also benefited from the watering action. Waterbird surveys conducted since the watering began have identified over 22 species, including state-listed waterbirds such as the Musk Duck, Australian Shoveler, Blue Billed Duck, Freckled Duck and Great Crested Grebe.

Frog and tadpole monitoring has revealed the presence of six frog species including a large number of southern bell frog tadpoles (EPBC act listed), once again confirming the importance of environmental watering in the recovery of this threatened species. The combination of a permanent anabranch system and ephemeral wetlands make Chowilla one of the most important sites for this frog in the South Australian River Murray corridor. Indeed monitoring has revealed that between 2004 and 2008 there has been an increase in Southern Bell Frog breeding in direct response to the environmental watering program.

Flood dependent understorey vegetation has also benefited from the application of environmental water. The understorey vegetation monitoring program has revealed a significant change from flood dependent understorey species to a less diverse and more salt tolerant community at unwatered sites.

3.7.2 Other Sites

Wakool system

Between November 2007 and March 2008, 6 GL of environmental water was delivered to the Wakool system along with 28 GL of NSW Stock and Domestic flow. This coordinated watering provided land-holders with access to stock and domestic water as well as replenished waterhole refuges for native fish species.

The monitoring programme indicated that fish populations were sustained in the Wakool system. A report of these results is currently being prepared by the NSW Department of Primary Industries.

Banrock Station wetland

The Ramsar-listed Banrock Station wetland was disconnected from the Murray River in December 2006 as a water-saving measure resulting in the wetland becoming dry in March 2007. Saline groundwater incursion posed a significant threat to the surrounding red gums and the potential development of acid sulphate sediments. An allocation of 617 ML of environmental water, plus 215 ML provided by Hardy Wines, was provided in June 2008.

Early monitoring results have shown that the watering event has provided habitat for wetland biota and is expected to mitigate the threat of salinisation and tree death. There have been recent signs of new growth in trees and over 22 bird species have been recorded at the wetland, including the great egret (listed under China and Australia Migratory Bird Agreement [CAMBA] and the Japan and Australia Migratory Bird Agreement [JAMBA]). To date, a total of 11,609 fish from 12 species have been sampled from Banrock wetland, including golden perch and freshwater catfish. Three frog species have also been identified. It is expected that the diversity of species may increase in spring during the main breeding season.

Wetlands below Lock 1 on the Murray River

During 2007 approximately 50 wetlands were disconnected as part of a water recovery program and resulting from the current drought. By the end of 2007, a further 23 wetlands were at various stages of drying. Due to this drying event, acid sulphate soils and salinisation became significant risks to the long-term health of these wetlands. A scientific assessment highlighted five wetlands that were at a high risk of becoming acidified. The watering of these wetlands sought not only to lessen the risks of acidification and salinisation, but also to prevent permanent vegetation changes and provide critical refuges for fauna species. In early 2008, 1.5 GL of water was delivered to these 5 wetland sites.

Subsequent monitoring has shown that although there had been difficulty maintaining water in some of these wetlands, the impacts of acidification and salinisation have been minimised and there have been improvements in water quality at the wetland sites. Bird breeding has occurred at 2 sites and over 40 bird species have been recorded since the inundation of Paiwalla. Six species of frogs were also recorded at Paiwalla whilst 4 species were recorded at Morgan's Lagoon and the vulnerable southern bell frog was heard calling at Riverglades. There was also an improvement in both the diversity and abundance of littoral vegetation and the health of long-lived vegetation at some inundated wetland sites.

3.8 General Monitoring Program Progress

Monitoring programs are conducted by jurisdictional partners at all of the icon sites to assess the impact of the program on TLM ecological objectives. Data on fish, bird and vegetation have been and are being collected to report on icon site condition and to assess the response from different types of environmental watering.

The Living Murray Outcomes Evaluation Framework (OEF), guiding the development of the ecological monitoring arrangements across the six icon sites, was further progressed in May 2007 and continues to underpin the monitoring process. The OEF identifies River Murray System, Condition, Intervention and Compliance monitoring as important within the framework. River Murray System monitoring has been initiated to enable a consistent approach to reporting across Icon sites and to report on overall improvements to the system as a result of The Living Murray program. In summary, system monitoring has:

- implemented the Annual Aerial Waterbird Survey of Icon sites starting in November 2007. This links with the Annual East Australia Waterbird Survey and reports on the condition of Icon sites and compares to other locations across East Australia,

- commenced a long term project to assess canopy condition of Red Gum and Black Box across all Icon sites using remote sensing commencing in 2008. This project is supported by on-ground vegetation condition assessments, and
- interacted and co-ordinated with other projects and initiatives to provide an assessment of fish status across the system.

Final drafts of individual Icon Site Condition Monitoring Plans are currently being prepared in reference to condition monitoring and against the ecological objectives and has recently been reported in the Icon Site Condition Report 2008.

Intervention monitoring projects were also undertaken in 2007–08 to provide information and understanding on the range of possible environmental watering interventions at icon sites and ecological outcomes. These projects are undertaken over several years and include:

- assessments of larval fish recruitment success rates;
- research on cues to prevent fish being trapped behind forest regulators;
- ecological responses to weir manipulation;
- assessment of outcomes of pumping to icon site wetlands, lakes and floodplains; and
- assessment of the resnagging in the River Murray on fish population growth and distribution.

The outcomes of these projects will inform future management at each of the icon sites. Compliance monitoring within the environmental monitoring program has been advanced with hydrographic stations monitoring implementation at icon sites and in particular working with MDBC-River Murray Water and the Barmah Millewa Icon site over 2007–08.

3.9 Consultation and Communication

The aim of the TLM communications program is that consultation and communication will be undertaken to ensure that individuals and groups who are likely to be impacted upon or materially interested in activities under this Business Plan have adequate opportunity for involvement.

Community consultation

The Living Murray’s community consultation activities are conducted primarily through The Living Murray Community Reference Group (CRG) and the individual icon site CRGs reporting to it.

The group advises the Murray–Darling Basin Community Advisory Committee and, through it, the Murray–Darling Basin Ministerial Council.

State Based Coordination

Approval for 3 State-based TLM coordinators has been given and a process to appoint these is underway. They will help coordinate all TLM communication in their respective states.

Indigenous Partnerships

The Indigenous Partnership Program, which works on a process of ‘informed consent’, seeks to engage Indigenous people in The Living Murray program in a way that ensures their social, spiritual, cultural, environmental and economic interests are included in planning and management of the icon sites.

There was further development of the MOU between the Murray Lower Darling Rivers Indigenous nations (MILDRN) and MDBC during 2007–08, strengthening a long-standing arrangement that enhances the Commission’s Indigenous consultation process across a range of issues.

Publications

Several factsheets, a newsletter, two posters and progress report were produced. At present, there are 26 publications that provide specific information about The Living Murray program, and a distribution strategy has been developed, and regularly updated, to ensure that key groups and individuals regularly receive these publications as they become available. Display hubs have been set up in a number of locations to specifically promote The Living Murray publications.

Electronic media

The TLM component of the MDBC website is regularly updated. A communiqué from each TLM CRG meeting is provided on the web soon after the group meets. Reports have also been added to the website.

A DVD, and supporting educational material, was developed for the Hattah Lakes icon site, in partnership with Environment Victoria. The DVD highlighted the environmental and social values of Hattah Lakes through the stories of 12 people.

In 2007, the MDBIC provided funding for the development of a DVD by teachers and students from Burrumbuttock Public School. The DVD helps students learn more about the Murray-Darling river system and The Living Murray program. 'The Living River' video has five segments, each relating a multi-staged unit of work. The project was a joint project between the NSW Department of Education and Training Curriculum Directorate and the Commonwealth Government Australian Quality Teacher Program (AQTP).

Events and sponsorship

Through The Living Murray, a number of project launches, community forums, and information days have been organised or supported.

Twenty three regional events received sponsorship support from The Living Murray program in 2007–08. These included activities undertaken through a project delivered by the Murray Darling Association, such as local government bus tours, school tours and youth forums focusing on the Murray River.

3.10 Impacts on, and Adjustment of the Cap on Diversions

The Living Murray Business Plan (Clause 203 (v)) requires that the management of the impacts on the Long Term Cap Equivalents resulting from the recovery and delivery of water will be subject to audit by the IAG.

The MDBIC has amended Schedule F of the *Murray-Darling Basin Agreement 1992* to allow the Murray-Darling Basin Ministerial Council to adopt a protocol that the Commission could use for adjusting the Cap for the recovery and use of environmental water.

At the end of 2007–08 a draft protocol for adjusting the long term diversion cap as a result of recovering and using environmental water was

being finalised. All states are actively participating in discussion and developing methodology to implement the protocol.

Pending that development, there have been no adjustments to the Long Term Cap Equivalents in 2007–08. For the 13 GL measure listed by South Australia, it is envisaged that adjustments will need to be made in 2008–09 retrospectively to account for recovery and use in 2007–08.

3.11 IAG Assessment

3.11.1 Overview

The continuation of extreme drought conditions in the southern part of the Basin saw further ecological decline in many parts of the Murray, which, in some instances, may be approaching an irrecoverable state. Continued threat of the development of acid-sulphate sediments at several sites, including the Lower Lakes, is a case in point. Other, less-palpable, changes may be equally as threatening.

Results from the monitoring program have amply demonstrated the capacity of icon sites to respond to environmental allocations but to date these allocations have been extremely limited both in space and time. As a consequence all but a very small proportion of most icon sites remain without intervention and the ecological gains from some current allocations may be transitory. Incorporating consideration of the enhanced value of repeat waterings (e.g. at Chowilla) in setting allocation priorities shows a level of sophistication that will be of considerable benefit in apportioning larger environmental water reserves in the future.

The level of collaboration within the EWG appears to have been high and productive. Methods for prioritising environmental allocations appear well developed and, given the severe shortage of water, produced outstanding results. These outcomes have been captured by the targeted monitoring program (see Living Murray Icon Site Condition Report Oct. 2008) whilst the continued, larger-scale, decline is represented in the condition monitoring program.

3.11.2 Issues Identified and Recommendations

Recommendation 2008.02 Role and performance of the Environmental Watering Group

The IAG believes that the deployment of the very scarce reserve of environmental water during 2007–08 has been carried out well and that the available evidence indicates a high level of efficacy. The EWG has proven to be an effective vehicle for collaborative assessment and management of TLM allocations, although yet to be tested under conditions of relative plenty (when water may be available for allocation to lower priority uses).

Much of the successful decision-making of the EWG is based on the expert judgement of its members and their advisers.

Whilst acknowledging this, *the IAG recommends* that the EWG be invited to document the steps followed in prioritising their response to competing demands for environmental water and the principles upon which these steps are based, as a template for making similar decisions across Jurisdictions on a Basin-wide scale.

Recommendation 2008.03 Impact of prioritisation of the Environmental Works and Measures Program on the use and effectiveness of the environmental water portfolio

The prioritisation of the EWMP, including delisting of a number of projects and possible changes to budgets and time-lines, will result in changes to TLM’s capacity to allocate and deliver environmental water to some icon sites. There is a significant risk that this will alter the relative ecological value (or benefit) of water distributed amongst icon sites and therefore a need to assess the impact of these changes on the achievement of environmental objectives and the use of environmental water.

The IAG recommends that the MDBA TLM team assess the impacts of the EWMP

prioritisation on the capacity to achieve the icon site environmental objectives and provide a report to the EWG and the IAG.

Recommendation 2008.04 Use of TLM water to redress effects of emergency management actions

During 2007–08 small allocations of TLM environmental water were diverted to avoid unforeseen environmental damage at sites at which water had previously been saved and diverted for other uses. Under the extreme circumstances prevailing, and with no acceptable alternatives immediately available, the EWG agreed to this allocation and their decision is endorsed by the IAG.

However, *the IAG recommends* that use of TLM environmental water in this way is an action of last resort and that water to redress unforeseen threats resulting from management actions be sourced by the responsible management authority.

ANNEX 1– SPECIFIC ENVIRONMENTAL OUTCOMES

As part of the *First Step Decision*, the Council identified six Icon Sites and the environmental value objectives for each site.

Icon Site	Environmental objectives, and expected outcomes
Barmah–Millewa Forest	<p>Enhance forest, fish and wildlife values:</p> <p>Successful breeding of thousands of colonial waterbirds in at least three years in ten.</p> <p>Healthy vegetation in at least 55% of the area of the forest (including virtually all of the Giant Rush, Moira Grass, River Red Gum forest, and some River Red Gum woodland).</p>
Gunbower and Koondrook– Perricoota Forests	<p>Maintain and restore a mosaic of healthy floodplain communities.</p> <p>80% of permanent and semi-permanent wetlands in healthy condition.</p> <p>30% of River Red Gum forest in healthy condition.</p> <p>Successful breeding of thousands of colonial waterbirds in at least three years in ten.</p> <p>Healthy populations of resident native fish in wetlands.</p>
Hattah Lakes	<p>Restore healthy examples of all original wetland and floodplain communities</p> <p>Restore the aquatic vegetation zone in and around at least 50% of the lakes to increase fish and bird breeding and survival</p> <p>Increase successful breeding events of threatened colonial water birds to at least two in ten years (Spoonbills, Little, Intermediate and Great Egrets, Night Herons and Bitterns).</p> <p>Increase the population size of and breeding events of the endangered Murray Hardyhead, Australian Smelt, Gudgeons and other wetland fish</p>
Chowilla Floodplain (including the Lindsay– Wallpolla system)	<p>Maintain high biodiversity values of the Chowilla Floodplain:</p> <p>High value wetlands maintained.</p> <p>Current area of River Red Gum maintained.</p> <p>At least 20% of the original area of Black Box vegetation maintained.</p>
Murray Mouth, Coorong and Lower Lakes	<p>A healthier Lower Lakes and Coorong estuarine environment.</p> <p>Open Murray Mouth.</p> <p>More frequent estuarine fish spawning.</p> <p>Enhanced migratory wader bird habitat in the Lower Lakes.</p>
River Murray Channel	<p>To increase the frequency of higher flows in spring that are ecologically significant.</p> <p>To overcome barriers to migration of native fish species between the sea and Hume Dam.</p> <p>To maintain current levels of channel stability.</p> <p>Expanded ranges of many species of migratory fishes.</p> <p>Similar or lesser levels of channel erosion to those currently observed.</p>

ANNEX 2 – PROGRESS REPORT ON ISSUES IDENTIFIED IN, 2004–05, 2005–06 AND 2006–07 AUDITS

Issues and Recommendations from the 2006–07 Audit	
2006–07 ISSUE and RECOMMENDATION	RESPONSE (October 2008)
<p><i>Issue 2007.01</i></p> <p>Collaboration between funders to achieve water recovery targets.</p> <p><i>The IAG recommends that cooperation and coordination be enhanced between the partner governments, to the extent possible and permissible, to facilitate the effectiveness of governmental water recovery programs and hence the likelihood of achieving TLM Water Recovery targets, and to avoid unnecessary competition and associated community confusion.</i></p>	<p>During 2007–08, a COAG working group was established by the Australian Government to consider all options for cooperation and /or coordination of water recovery efforts. Avoiding any perception of collusion was given a high degree of importance. Given that water recovery investments are made by a variety of agencies involving some quite different arrangements, maintaining the flexibility to control price and other factors was also important. The process recognised there were multiple government agencies in the market place but that this was mostly confined to the “southern connected Basin” and that the time of most congestion would most likely only extend over the next year.</p> <p>TLM’s Water Recovery Working Group maps out TLM water recovery initiatives and strives to ensure and improve the effectiveness of the initiatives.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>
<p><i>Issue 2007.02</i></p> <p>Risk assessment procedures to account for current and recent threats to water recovery.</p> <p><i>The IAG recommends that:</i></p> <p><i>(i) changes in the risks to basin water resources during the period between the initial implementation of the Cap until now be acknowledged, assessed and accounted for so as to avoid disproportionate erosion of environmental water and maintain the balance in The Living Murray recovering water for use at the Icon Sites; and</i></p> <p><i>(ii) an agreed baseline and framework for assessing risks to water resources across the Basin be established.</i></p>	<p>An agreed baseline and framework for assessing risks to water resources across the Basin has been proposed. The assessments being undertaken by jurisdictions for the 2007–08 audit by the IAG of the Risks to Shared Water Resources program are seeking to recognise the legacy of the impacts from the identified risk factors from the cap on diversions baseline and to consider the extent to which the legacy impacts can be quantified. The issue of disproportionate erosion of environmental water may then be addressed.</p> <p><i>IAG Comment: The status of the response is noted.</i></p>
<p><i>Issue 2007.03</i></p> <p>Need to maintain time-frame of water recovery.</p> <p><i>The IAG recommends that the original timeframe for realisation of water recovery be adhered to where possible but that some latitude is considered in regard to the timing of recovered water being placed on the Environmental Water Register.</i></p>	<p>The original timeframe for water recovery has been maintained but there has now been formal acknowledgement by the Commission that there will be some administrative tidying up past June 2009 and that not all water will be listed on the Environmental Water Register by June 2009 even if projects have been completed.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>
<p><i>Issue 2007.04</i></p> <p>Need to clarify the auditing of financial records.</p> <p><i>The IAG recommends that consideration be given to amending clause 204 of the Business Plan (2007) to clarify the intent of auditing financial records to be kept by jurisdictions as referred to in clause 203 i) and ii) and to facilitate practical audit procedures.</i></p>	<p>In considering this issue agreement was reached that an amendment to the Business Plan was not necessary and that an appropriate interpretation was that evidence such as an audit report commissioned by the jurisdiction, or a financial report of similar status, being provided to the IAG was sufficient.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>

Issues and Recommendations from the 2006–07 Audit	
2006–07 ISSUE and RECOMMENDATION	RESPONSE (October 2008)
<p>Issue 2007.05</p> <p>Timely development and delivery of water application infrastructure projects augmented through additional funding.</p> <p><i>The IAG recommends that every effort should be made to comply with previously established deadlines but that sufficient flexibility be maintained in project programming to ensure that modelling is adequate and the design of works maximises the effective use of increased funding through ensuring that works are effective in meeting the environmental objectives throughout their operational life.</i></p>	<p>Efforts have been made by all jurisdictions to accelerate the works program to meet original commitments and the acceleration expected when additional funds were provided to TLM by the Australian Government in 2006.</p> <p>As part of the EWMP Mid-term Review, independent advice has been received on the likely cost and timeframe to establish the works planned by jurisdictions at Icon Sites. This advice confirmed that it will take until 2014 to complete the works program. A formal extension to the works program has not yet been proposed to the Ministerial Council.</p> <p>In September 2008, a forum was held to review the concept designs at all sites to maximise effective use of the funding. Works for many sites will now proceed to detailed design. Delivery arrangements for the works program are also being externally reviewed, as at October 2008.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>
<p>Issue 2007.06</p> <p>Human Resources.</p> <p><i>The IAG recommends that:</i></p> <p><i>(i) efforts continue with partner governments to address the skills shortage, and</i></p> <p><i>(ii) the shortfall in capacity is acknowledged and planned for in timing delivery of The Living Murray. This may necessitate the recognition of a longer timeframe for complete delivery of The Living Murray as foreshadowed by IAG in 2005–06.</i></p>	<p>Efforts have continued to address skills shortages. Partner governments have been supported financially to employ extra staff. Indigenous facilitators have been employed at many Icon sites. Information sessions and other centralised forums have been held to support regional staff and encourage collaboration.</p> <p>It is recognised that the shortfall in staffing/capacity over the life of TLM will effect the ability to achieve the deliverables in a timely fashion. As outlined in the progress on issues 2007.03 and 2007.05, there is acknowledgment that this will influence the ability to meet the established water recovery and works and measures target dates, although there has been no formal change to target dates.</p> <p><i>IAG Comment: The recommendation has been addressed, the ongoing challenges relating to skills shortage and project delivery acknowledged and the recommendation is assessed as being completed.</i></p>

Issues and Recommendations from the 2006–07 Audit	
2006–07 ISSUE and RECOMMENDATION	RESPONSE (October 2008)
<p>Issue 2007.07</p> <p>Preservation of key relict communities at Icon Sites and monitoring of affects of continued extreme conditions.</p> <p><i>The IAG recommends that watering of Icon Sites is strategically targeted to ensure that, in the short term, key relict populations survive the current drought; that monitoring continues to maximise learning from the extreme circumstances; and to ensure the application of environmental water to optimise recovery when greater volumes become available. It is suggested that the Environmental Watering Group makes public the reasons for selection of watering priorities.</i></p>	<p>In 2007–08 the Commission office continued to coordinate the Environmental Watering Group to prioritise sites for watering. Criteria were established for the prioritisation of sites, one of which related to protection of drought refuges. The identification of key relict populations and drought refuges by partner governments remains a critical input to setting watering priorities.</p> <p>TLMC have requested advice from the Scientific Reference Panel on approaches to protection of refuges.</p> <p>The various levels of monitoring (condition, compliance and intervention) have continued to be implemented and all watering events in 2007–08 were specifically monitored.</p> <p>The Environmental Watering Group will make public the reasons for the selection of priorities by publishing an annual Environmental Watering Report.</p> <p><i>IAG Comment: The effort to preserve relict communities during 2007–08 is strongly commended. The IAG notes, however, the increasing urgency driven by continued drought and encourages as much haste as possible in environmental water acquisition. The recommendation has been addressed and is assessed as being completed.</i></p>
<p>Issue 2007.08</p> <p>Rationalisation of management arrangements in multi-jurisdictional Icon Sites to achieve holistic ecological outcomes.</p> <p><i>The IAG recommends that:</i></p> <p><i>(i) the Living Murray Committee ensure that planned environmental outcomes reflect the developing understanding of Icon Sites and the objectives proposed by the Ministerial Council; and</i></p> <p><i>(ii) the management arrangements for Icon Sites, particularly in relation to the management of available environmental water, be reviewed to ensure that a single, integrated management structure is in place, with an accountable manager being appointed on merit through a joint process and with the lines of authority clearly defined, to ensure that sites are managed holistically to optimise spatially diverse ecological functions that combine to achieve planned outcomes.</i></p>	<p>Environmental outcomes / objectives have not yet been revised but a program of work is planned to revise them once the works and water modelling which is being undertaken for the icon sites is completed (the modelling should identify the extent to which objectives can be met at sites).</p> <p>A single accountable manager has not been established at each site although the Icon Site Manager continues to have responsibility for coordination across sites which cover multiple jurisdictions. Appointing a single manager with clear lines of authority at cross border sites raises land ownership issues as well as being a challenge within the states legal and policy frameworks. However, a high level of collaboration between the jurisdictions, principally driven through the Environmental Watering Group or its subgroups, has ensured planning, priorities and actions (including the program of future works) have been approached and determined in an integrated way.</p> <p><i>IAG Comment: The progress in relation to the review of planned environmental outcomes is noted, as is the role of the Environmental Watering Group in providing effective coordination across icon sites which cover multiple jurisdictions with regard to water allocation. The development of management plans and infrastructure proposals appear yet to be coordinated.</i></p>

Issues and Recommendations from the 2006–07 Audit	
2006–07 ISSUE and RECOMMENDATION	RESPONSE (October 2008)
<p>Issue 2007.09</p> <p>Accounting for continued ecological decline resulting from extended extreme climatic conditions.</p> <p>The IAG recommends that the environmental objectives and milestones for managing the Icon Sites be reviewed in the light of the impacts of the severe drought to ensure realistic, planned outcomes.</p>	<p>During both 2006–07 and 2007–08, the condition of the icon sites has been reported. As reported on issue 2006.03, The Living Murray Committee has formally requested that the achievability of the objectives is reviewed. This task has been scheduled to occur once works and water modelling results for the icon sites are available.</p> <p><i>IAG Comment: The status of the response is noted.</i></p>
Issues and Recommendations from the 2005–06 Audit	
2005–06 ISSUE and RECOMMENDATION	PROGRESS (October 2008)
<p>Issue 2006.01</p> <p>The IAG recommends that the Ministerial Council:</p> <p>(i) note that skills shortages are affecting the rate of water reform implementation including <i>The Living Murray</i>; and</p> <p>(ii) develops a strategy in partnership with other stakeholders to attract additional skilled resources into the water sector for both the short and long term.</p> <p>The Ministerial Council may wish to consider the timeframes for the delivery of <i>The Living Murray</i> given this significant and ongoing constraint.</p>	<p>Measures to increase the capacity of both the jurisdictions and the office to implement the agreed TLM program have been identified over the last two years and implemented. This has included increased financial support for jurisdictions to support core TLM positions and to be able to work with constructing authorities.</p> <p>As with last year, the drought has diverted experienced TLM staff onto tasks associated with contingency planning and drought measures.</p> <p>The shortfall in experienced staff in the water resources area will continue to be an issue as the demand increased with newly legislated or funded activities including the Commonwealth Water for the Future Initiative and the basin planning role in the new Murray Darling Basin Authority.</p> <p><i>IAG Comment: The recommendation has been addressed, the ongoing challenges relating to skills shortage acknowledged and the recommendation is assessed as being completed.</i></p>
<p>Issue 2006.02</p> <p>The IAG recommends that the full suite of water recovery measures, including market-based measures, be utilised in order to maximise the likelihood that the 500 GL water recovery target is met by June 2009.</p>	<p>An expanded suite of water recovery measures has been developed and is being implemented, including purchase programs by the Commission office and NSW. With the expanded suite of water recovery products now being implemented, the likelihood of recovering the 500 GL target is looking more optimistic.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>
<p>Issue 2006.03</p> <p>The IAG recommends that the Ministerial Council considers the wider context in which <i>The Living Murray</i> is being implemented, in particular the considerable threats to water availability and considers the need to review the achievability and the possible adjustment of the environmental objectives for all Icon Sites and <i>The Living Murray</i> overall.</p>	<p>Modelling to ascertain if the water requirements identified by jurisdictions in blueprints for icon sites can be delivered within the boundaries of the first step decision (500 GL water recovery) is now largely completed. The Living Murray Committee has formally requested that the achievability of the objectives is reviewed. This task has been scheduled to occur once works and water modelling results are available.</p> <p><i>IAG Comment: The status of the response is noted.</i></p>

Issues and Recommendations from the 2005–06 Audit	
2005–06 ISSUE and RECOMMENDATION	PROGRESS (October 2008)
<p><i>Issue 2006.04</i></p> <p><i>The IAG recommends that jurisdictions apply very diligent project management arrangements to water recovery activities in order to meet The Living Murray target of 500 GL by June 2009.</i></p>	<p>The development of the projects on the eligible measures register over the past year to a stage that Investment Agreements can be agreed has provided the clarity and progress on projects to suggest that the 500GL will be largely delivered by the original timeframe of June 2009.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>
<p><i>Issue 2006.05</i></p> <p><i>Recommendation: The IAG recommends that in any assessment of the achievability of the outcomes identified under The Living Murray First Step Decision that assessments of timelines for outputs delivery as well as when expected environmental outcomes become apparent also be prepared.</i></p>	<p>Recommendation addressed: These links are now established in the Environmental Watering plans and the Icon site Condition Report. Modelling also provides a basis to test the possible outcomes on ground against frequency and expected outcomes.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>
<p><i>Issue 2006.06</i></p> <p><i>Recommendation: The IAG recommends that the Ministerial Council ensure sufficient priority and resources are committed to the hydrologic modelling of The Living Murray such that this information is available no later than October 2007.</i></p>	<p>Ongoing:</p> <p>In previous years the majority of model development was occurring with hydraulic modelling at the Icon sites and hydrologic modelling to confirm savings from water recovery projects.</p> <p>Over the past year, substantial resources have been committed to hydrologic modelling of the works and water packages for each site. Two stages of 3 of this modelling are now completed and provide sound information on viability of watering the sites on a landscape scale (up to 35,000 ha). The optimisation phase of this project will occur over 2008 and 2009.</p> <p>Ultimately, it is hoped that the hydraulic modelling at sites can be represented in the hydrologic modelling platform.</p> <p>Ecological response modelling for the Icon sites is also being developed in a new project with e-Water and will draw upon monitoring results from watering events at the Icon sites.</p> <p><i>IAG Comment: Progress is noted and will be further reviewed in 2009</i></p>
<p><i>Issue 2006.07</i></p> <p><i>Recommendation: The IAG recommends that the outstanding tasks identified in relation to the management of unregulated flows be addressed as soon as possible.</i></p>	<p>Ongoing: There has been ongoing negotiation of the management of unregulated flows during 2007–08. An important milestone is that a trial process has been developed in which states have agreed to a process to establish priorities for the use of declared unregulated flow for environmental purposes.</p> <p><i>IAG Comment: Progress is noted and will be further reviewed in 2009.</i></p>

Issues and Recommendations from the 2005–06 Audit	
2005–06 ISSUE and RECOMMENDATION	PROGRESS (October 2008)
<p><i>Issue 2006.08</i></p> <p><i>Recommendation: The IAG recommends that a high priority be assigned to the completion of environmental water accounting, including arrangements for tracking and reporting interdependencies with the Cap on diversions.</i></p>	<p>In progress: Arrangements for tracking and reporting interdependencies with the Cap on diversions have been progressed with changes made to schedule F to allow Murray Darling Basin Ministerial Council to adopt a protocol that the Commission could use for adjusting cap for the recovery and use of environmental water. This protocol is drafted and currently in the process of being finalised.</p> <p>Work is ongoing to develop appropriate accounting procedures for environmental water and to this end the Commission office interacts, and undertakes pilot projects for, the National Water Accounting Standards Development Initiative.</p> <p>Assumptions have been made on how TLM water will be accounted for in the water and works modelling. Many of these assumptions include policy decisions which are yet to be considered by the Environmental Watering Group.</p> <p><i>IAG Comment: Progress noted. IAG urge continued effort in this regard. Progress will be reviewed in 2009.</i></p>
Issues and Recommendations from the 2004–05 Audit	
2004–05 ISSUE ⁶	PROGRESS (as at October 2008)
<p><i>Issue 2005.04</i></p> <p><i>Recommendation: The IAG recommends that jurisdictions move to establish Environmental Water Registers as soon as possible.</i></p>	<p>In progress: Activity is underway in the jurisdictions to establish Environmental Water Registers.</p> <p><i>IAG Comment: Given that water has now begun to be listed on the central Environmental Water Register, the Independent Audit Group would like to cite the registers in each jurisdiction next year. The register should be in place in each jurisdiction by the time that the first water is recovered. Progress noted and will be reviewed in 2009</i></p>
<p><i>Issue 2005.07</i></p> <p><i>Recommendation: The IAG recommends acknowledgement of environmental initiatives post-Cap and pre-The Living Murray in future editions of The Living Murray Environmental Watering Plan and in the Environmental Water Register. These would, however, not be part of the 500 GL target.</i></p>	<p>Recommendation addressed and ongoing: Appropriate acknowledgement of prior initiatives and other watering actions are now recognized as a matter of course in documentation such as the Environmental Watering Plan and the Annual Environmental Watering Report. Other 'environmental water' is publicly acknowledged on the MDBC website.</p> <p><i>IAG Comment: The recommendation has been addressed and is assessed as being completed.</i></p>

⁶ Issues 2005.01, 2005.02, 2005.03, 2005.05 and 2005.06 reported in last years Audit report as completed actions so not shown again.

ANNEX 3 – RESPONSES FROM STATE AND TERRITORY GOVERNMENTS

Upon request, written responses from State and Territory Governments to the Independent Audit Group's Report are published as an annex to the Report.

SOUTH AUSTRALIA

Matters of Fact/General Comments

Page 12: *A cost and scheduling review, the first component of the EWMP mid-term review, completed.*

This paragraph refers to the EWMP prioritisation process resulting in the identification of six major ongoing priority projects. It should be noted in this paragraph that the sixth Icon Site (Lakes, Coorong and Murray Mouth) was not prioritised for major works through the EWMP on the basis that a long-term management plan is being developed through Murray Futures, which will inevitably address the TLM objectives. This does not in any way detract from the commitment to the Lakes, Coorong and Murray Mouth as a TLM Icon Site and, should the EWMP funding be extended, funding may be sought from that budget to further the objectives of the TLM.

Specific comments on IAG Recommendations:

Recommendation 2008.01 Timing and Funding Availability

This was a significant issue for South Australia in negotiating investment for its 5 GL and 17 GL water recovery measures. It resulted in South Australia investing well beyond its first call share in its 17 GL measures and as a consequence being unable to invest in measures put forward by other jurisdictions during 2008. At this stage of the TLM Water Recovery Program there is no remedial action that can occur.

Recommendation 2008.02 Role and performance of the Environmental Working Group (EWG)

Discussions are currently occurring between the EWG and Commonwealth Environmental Water Holder (CEWH) in relation to shadowing of environmental water, i.e. drawing on consistent prioritisation criteria and seeking opportunities to maximise watering actions by piggy backing TLM and CEWH water. South Australia supports documentation of the prioritisation steps and suggest the IAG report specifically recommends a close

partnership between TLM and the CEWH in relation to environmental water. South Australia considers that the EWG should be the primary consultation group for the development of the Basin Environmental Watering Plan.

Recommendation 2008.03 Impact of prioritisation of the Environmental Works and Measures Program (EWMP) on the use and effectiveness of the environmental water portfolio

It is becoming increasingly clear that landscape scale works will be required in the future to enable broad scale floodplain inundation. However, there is currently no provision for an extension of the EWMP budget beyond its current life. This shortcoming needs to be urgently addressed in order to meet the TLM objectives and ensure further works into the future. While South Australia agrees with the recommendation that the MDBA should assess the capacity of the EWMP to achieve the Icon Site objectives, this should focus on the benefits of additional funding, as opposed to scaling back the objectives.

Recommendation 2008.04 Use of TLM water to redress effects of emergency management actions

Given the critical environmental degradation across the length of the River Murray, South Australia believes it is appropriate that TLM environmental water use be considered for all sites nominated by jurisdictions regardless of whether they fall within the boundaries of an Icon Site, subject to the agreed prioritisation process and with Icon Sites given first preference for water.

The boundaries of the River Murray Channel Icon Site need to be clarified, which will mean some sites currently considered outside the Icon Sites could fall into the River Murray Channel Icon Site category. There could potentially be a definition of the lateral extent of the Channel Icon Site that is used during drought conditions, but which takes on a different scope during 'normal' inflow years.

NEW SOUTH WALES

At NSW's request, the following correspondence from the MDBA has been annexed in the Independent Audit Group's Report in place of their comments.



Australian Government



Trim Ref: D09/8621

9 June 2009

Lisa Corbyn
Director General
NSW Department of Environment and Climate Change
PO Box A290
SYDNEY SOUTH NSW 1235

Dear Lisa,

Re: The Living Murray Independent Audit Group Report 2007/8

Thank you for your comments in response to The Living Murray (TLM) Independent Audit Group report 2007/8, from the TLM Committee Out-of-Session 2 - 1 May 2009.

We note your comments regarding Recommendation 2008.03 of the report, indicating that NSW would not support another review of Environmental Works and Measures Program (EWMP) priorities.

Please note that we have subsequently sought clarification from the Independent Audit Group, and can confirm that the recommendation's intent was not to seek another review of EWMP priorities. Rather, the recommendation seeks an assessment how the effectiveness and use of TLM's environmental water portfolio was affected by the prioritisation of EWMP.

We hope this clarification is of assistance. Please feel free to contact me if you have any further questions.

Kind regards

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ANNEX 4 – GLOSSARY OF TERMS

This *Glossary of Terms* has been taken directly from The Living Murray Business Plan. It is reproduced here in full to assist in interpretation of this audit.

Access characteristics – The conditions under which the entitlement holder can access water. These will vary across States and the Territories, water management areas or source. Characteristics may govern timing and volume and other circumstances as required.

Bulk entitlement (Vic) – The right to water held by water and other authorities defined in the Water Act. The Bulk Entitlement defines the amount of water that an authority is entitled to from a river or storage, and may include the rate at which it may be taken and the reliability of the entitlement.

Crediting amount – Cost and volume at which the MDB Ministerial Council agrees to accredit investment in water recovery measures against the financial and volumetric commitments of jurisdictions under the Intergovernmental Agreement.

Developmental Register – Register of water recovery measures which have undergone a feasibility assessment, and are considered likely to meet the criteria for listing on the Eligible Measures Register in the future.

Eligible Measures Register – Register of accredited water recovery measures for investment under the Intergovernmental Agreement.

Environmental entitlement – a firm, non-discretionary perpetual entitlement for environmental water created under relevant State/Territory legislation and subject to terms and conditions as agreed between governments to meet the agreed environmental objectives held by the jurisdiction in which the water was recovered.

Final crediting amount – cost and volume at which investment in a water recovery measure will be accredited against water recovery and financial targets established in this Business Plan.

General security (NSW) – NSW water access entitlements that vary from year to year depending on inflows and storage levels (regulated rivers) and river flows (unregulated years).

High security (NSW) – NSW water access entitlements drawn from a regulated system that provides 100% allocation in all but years of extreme drought.

Indicative crediting amount – the cost and volume at which investment in a water recovery measure will be accredited against water recovery and financial targets established in this Business Plan up until a final crediting amount is established.

Inside Cap (Share) – An entitlement for which water use is counted as use by a State under Schedule F of the *Murray-Darling Basin Agreement* contributing to the Long Term Diversion Cap.

Intergovernmental Agreement – The *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin* between the Australian Government and the Governments of New South Wales, Victoria, South Australia and the Australian Capital Territory, signed at the Council of Australian Governments meeting on 25 June 2004.

Jurisdictions – The Parties to the Intergovernmental Agreement, specifically the Australian Government, the State of New South Wales, the State of Victoria, the State of South Australia and the Australian Capital Territory.

Living Murray Committee – Advisory committee to the MDB Commission.

Living Murray Environmental Watering Plan – the Basin Environmental Watering Plan referred to in Clause 58 of the Intergovernmental Agreement.

Long Term Diversion Cap – A reference to the total volume of water permitted to be diverted within the Murray-Darling Basin in line with the Ministerial Council's decision to limit diversions to 1993–94 levels of development.

Long-Term Cap equivalent – the volume registered for a particular recovery work or measure calculated using the accepted best practice Cap computer model for that system as the:

- long-term average contribution to the Cap; or
- potential contribution to the long-term average flows in the relevant river valley.

Murray-Darling Basin Commission Office – The Office of the Murray-Darling Basin Commission provides the Commission with support services necessary for administering the Murray-Darling Basin Agreement and helping to deliver the Commission’s programs. This includes support for technical matters and policy formulation, and secretariat and administrative services to the Ministerial Council, Commission, Project Boards and the various committees advising the Commission.

Murray-Darling Basin Ministerial Council – Ministerial Council established under the Murray-Darling Basin Agreement, consisting of up to three Ministers from the Governments of the Australia, New South Wales, Victoria, South Australia and Queensland with prime responsibility for matters relating to water, land and environment.

National Water Initiative – The *Intergovernmental Agreement on a National Water Initiative* between the Australian Government of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, signed at the Council of Australia Governments meeting on 25 June 2004.

New environmental water (“new e-water”) – water recovered for the environment through investment under the Intergovernmental Agreement.

Old environmental water (“old e-water”) – water recovered for the environment prior to 29 August 2003.

Ongoing cost – costs arising from the management, storage or delivery of water to achieve the agreed environmental objectives.

Other new environmental water (“other new e-water”) – water recovered for the environment after 29 August 2003 and funded through investment other than the Intergovernmental Agreement.

Outside Cap (Rule) – An entitlement for which water use is not accounted as use by a State under Schedule F of the Murray-Darling Basin Agreement that is not counted within the Long Term Diversion Cap.

Overallocation – refers to situations where with full development of water access entitlements in a particular system, the total volume of water able to be extracted by entitlement holders at a given time exceeds the environmentally sustainable level of extraction for that system.

Packages – has the same meaning as proposal, where a proposal may comprise a single water recovery measure or a number of identifiable measures.

Regulated systems – watercourses that have their flows regulated by Government constructed dams, weirs or water storage schemes.

Regulated – when used in the Environmental Water Register, this term refers to water that is supplied from a system that is regulated by one or more major storages and can be ordered or “called” on either to be released from storage or to be supplied at a nominated diversion point.

Sales water (Vic) – the volume of water available in a particular season over and above Water Right. Access to Sales Water is announced each season as a percentage of Water Right depending on the available resource.

Translation factor – (for the purpose of paragraph 83 of the Business Plan) – is the ratio of environmental water delivered to the River Murray Channel to the volume of environmental water accounted at source.

Unregulated systems – watercourses in which flows are not regulated by dams, weirs or water storage schemes. A specific volume of water may be allocated but there can be no guarantee that the volume will still be available or supplied in any one year.

Unregulated – when used in the Environmental Register, this term refers to water that is supplied from an unregulated water system or water that is supplied from a regulated water system, but only during periods of declared “surplus” flows in the system.

Water access entitlements – a perpetual or ongoing entitlement to exclusive access to a share of water from a specified consumptive pool as defined in the relevant water plan.

Water Right (Vic) – High Security entitlement held by irrigators within the Victorian Irrigation Districts.



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