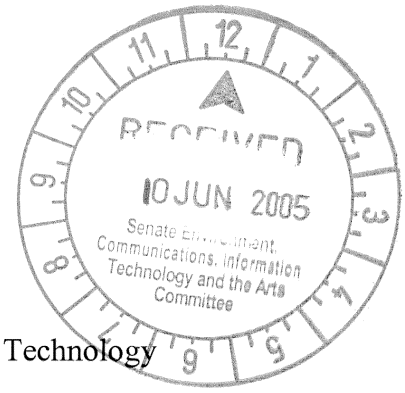
MDBC Ref: 05/6718

06 June 2005



MURRAY-DARLING BASIN COMMISSION

Ms Louise Gell
Committee Secretary
Senate Environment, Communications, Information Technology and the Arts Committee
Department of the Senate
Parliament House
Canberra ACT 2600

Dear Madam

Extent and Economic Impact of Salinity in the Australian Environment

Submission from the Murray-Darling Basin Commission

The Murray-Darling Basin Commission welcomes the opportunity to make a submission to the Inquiry into the extent and economic impact of salinity in Australia.

The Murray-Darling Basin Commission is proud of its achievements in addressing the social and economic impacts of salinity in the Basin and meeting the Basin salinity target at Morgan, South Australia.

The partner governments to the Murray-Darling Basin Agreement and the Commission are implementing the Basin Salinity Management Strategy (BSMS) to achieve the objectives of the strategy that includes agreed salinity targets in the River Murray and its tributaries by 2015. The National Action Plan for Salinity and Water Quality (NAP), the National Heritage Trust (NHT), Landcare and other national programs are an essential component in the Commission delivering the outcomes of the BSMS.

The outcomes of the National programs and the BSMS rely on regional management authorities having the capacity to implement their catchment plans as set out in the Intergovernmental Agreements between the Australian Governments and the States for NAP. Strengthening the linkages between NAP/NHT and the BSMS to support the delivery of salinity outcomes into the future would appear to be an important consideration.

We would welcome the opportunity to address the Committee in relation to the role that NAP/NHT programs make to the Murray-Darling Basin Commission's implementation of the BSMS, in particular the role of the Australian Government as a partner government of the Murray-Darling Basin Commission.

Yours sincerely

Wendy Craik
Chief Executive

Senate Committee on Environment, Communications, Information Technology and the Arts

INQUIRY INTO THE EXTENT AND ECONOMIC IMPACT OF SALINITY IN THE AUSTRALIAN ENVIRONMENT

SUBMISSION BY THE MURRAY DARLING BASIN COMMISSION 8 June 2005

Summary

The **Murray-Darling Basin Commission** (MDBC) is the Executive arm of the Murray-Darling Basin Ministerial Council. The Council is the partnership of six governments – New South Wales, Victoria, South Australia, Queensland, the Australian Capital Territory, and the Australian Government. The partnership is enabled by the Murray-Darling Basin Agreement 1992. It is responsible for:

- Managing the River Murray and the Menindee Lakes system of the lower Darling River; and
- Advising the Ministerial Council on matters related to the use of the water, land and other environmental resources of the Murray-Darling Basin.

The **Basin Salinity Management Strategy** (BSMS), released in 2001, provides the framework for salinity management in the Murray-Darling Basin to 2015. The BSMS has a system of salinity credits and debits supported by river salinity and salt load targets to manage salinity across the Basin. Current activities of salt interception and catchment actions are to deliver 61 EC and 10 EC respectively by 2015. Schedule C to the MDBC Agreement spells out the responsibilities of the jurisdictions in relation to the BSMS.

As outlined in Schedule C, the **Independent Audit Group for Salinity** undertakes an annual audit of the implementation of Schedule C by the partner governments and the Commission. The auditors report on their findings and any recommendations to the Ministerial Council, the most recent being for 2003-04.

Terms of reference (a)

The Commission has a role and responsibility to ensure delivery of agreed salinity targets. NAP & NHT have goals which are congruent with those of MDBC salinity targets to deliver salinity outcomes at the local community and regional scale. However, the MDBC does not have a direct role in ensuring delivery of NAP & NHT goals, the success of which impacts on the Basin's salinity targets. For instance, regional catchment action within the Murray-Darling Basin (MDB) is to deliver 10EC, with many actions depending on NAP & NHT achieving their goals.

Actions to meet some of the objectives are being supported through the regional investment plans identified by NAP and NHT and delivered by CMAs and State regional programs. These actions jointly with the MDBC investment are expected to deliver 61 EC from salt interception works in irrigated catchments and 10 EC from land use and environmental change within the dryland catchments of the Basin.

The Independent Audit Group for Salinity (IAG) in its 2002-2003 report stated "*The IAG is concerned that the achievement of BSMS objectives may be at risk due to a lack of explicit congruence of the BSMS end-of-valley targets and actions identified in the regional plans*" and recommended that the "*program of actions are reflected explicitly in the regional plans for each state*". It reported in 2003-04 that the timeframes associated with development of regional institutional arrangements have delayed implementation activities of the BSMS.

Progress has been made, however, in substantially reducing the impact of salinity in the river by 200 EC at Morgan, South Australia due to jointly funded works by the partner States, Commonwealth, and the MDBC.

Terms of reference (c)
While the MDBC has no active role in implementing the recommendations of the House of Representative inquiry "*Science Overcoming Salinity: Coordinating and extending the science to address the nation's salinity problem*" it continues to pursue its multilateral cooperative approach in ensuring that salinity policy and actions continue to be based on sound science.

The Australian Government has been instrumental in the development of science and innovation on which the MDBC has drawn and partnered including the National Dryland Salinity Program; National Land and Water Resources Audit and the Commonwealth's Cooperative Research Centre Program e.g. Catchment Hydrology, Plant-based Management of Dryland Salinity. The MDBC supports knowledge transfer through its partnerships with Government, State Agencies, Industry, Regional Organisations, and Basin Communities. Partnership arrangements are implemented through inter-jurisdictional projects and working groups. Commission working groups through their multi-lateral nature provide a strong coordinating context and allow for rapid dissemination of research and data across jurisdictions and agencies.

The Commission uses modelling to assign salinity credits and debits to Salinity Registers A & B according to Schedule C to the MDB Agreement. Such credit and debits are attributed to the States who have to maintain the Registers in credit. Schedule C requires reviews at least once every five years of each tributary valley and each Salinity Register item with several reviews due to be completed during 2005. The outcomes of these reviews, which are peer reviewed to ensure rigour, will improve our understanding of the nature and extent of the salinity threat into the future.

Recommendation
The inquiry may like to consider the means of ensuring that the NAP & NHT deliver on shared outcomes of the BSMS.

Introduction

The inquiry aims to assess the long-term success of programs funded by the Australian Government in reducing the extent of and economic impact of salinity in the Australian environment. The terms of reference of the inquiry asks that submissions address:

(a) whether goals of national programs to address salinity have been attained, including those stated in the National Action Plan for Salinity and Water Quality, National Heritage Trust and National Landcare programs;

(b) the role that regional catchment management authorities are required to play in management of salinity-affected areas, and the legislative and financial support available to assist them in achieving national goals; and

(c) what action has been taken as a result of recommendations made by the House of Representatives' Science and Innovation Committee's inquiry 'Science overcoming salinity: Coordinating and extending the science to address the nation's salinity problem', and how those recommendations may be furthered to assist land-holders, regional managers and affected communities to address and reduce the problems presented by salinity.

MDBC Role and Responsibility

The Murray-Darling Basin Commission (MDBC) is the Executive arm of the Murray-Darling Basin Ministerial Council. The Council is the partnership of six governments – New South Wales, Victoria, South Australia, Queensland, the Australian Capital Territory, and the Australian Government. The partnership is enabled by the Murray-Darling Basin Agreement 1992. Chaired by an independent President, the Commission is an unincorporated joint venture, comprising representatives (Commissioners) nominated by partner government agencies responsible for land, water, and environment. It is responsible for:

- Managing the River Murray and the Menindee Lakes system of the lower Darling River; and
- Advising the Ministerial Council on matters related to the use of the water, land and other environmental resources of the Murray-Darling Basin.

The Commission, as a partnership of the six Basin governments (including the Australian Government), exists to achieve optimal integrated catchment management outcomes for the shared resources of the Basin. Primary responsibility for managing land and water resources lies with individual State and Territory governments. The Commission concentrates on issues that require the joint action of partners to deliver the best outcomes for the Basin's communities, industries and natural resource base – particularly related to its shared water resources.

The main functions of the Commission, specified in clause 17 of the Murray-Darling Basin Agreement, are to:

- Advise the Ministerial Council in relation to the planning, development, and management of the Basin's natural resources;
- Assist Council in developing measures for the equitable, efficient, and sustainable use of the Basin's natural resources;
- Coordinate the implementation of, or where directed by Council to implement, those measures; and
- Give effect to any policy or decision of the Ministerial Council.

The Commission is also required to equitably and efficiently manage and distribute the water resources of the River Murray in accordance with the Murray-Darling Basin Agreement to obtain the highest achievable quality and efficiency of use of such resources.

The Commission therefore has a role in undertaking works and measures at the direction of the Ministerial Council, and also in coordinating the efforts of the government partners to the Murray-Darling Basin *Initiative*. It has the mandate to initiate, support, and evaluate integrated natural resources management across the Murray-Darling Basin. In this role, it developed the Basin Salinity Management Strategy that has as one of its objectives maintaining salinity at less than 800EC at Morgan 95% of the time.

The Commission works cooperatively with the partner governments, committees, and community groups to develop and implement policies and programs aimed at the integrated management of the Murray-Darling catchment and managing and distributing the water of the River Murray in accordance with the Murray-Darling Basin Agreement. This cooperative approach reflects the importance placed on Government-community partnerships and brings to participants and end-users the benefit of shared concerns and expertise, jointly developed and integrated solutions, and avoids duplication of effort.

The Basin Salinity Management Strategy

The Basin Salinity Management Strategy (BSMS), released in 2001, provides the framework for salinity management in the Murray-Darling Basin to 2015. The BSMS has a system of salinity credits and debits supported by river salinity and salt load targets to manage salinity across the Basin. The rules for implementing the BSMS have been formalised in Schedule C to the Murray–Darling Basin Agreement and a set of protocols for implementing Schedule C.

The objectives of the BSMS are:

- To maintain the water quality of the shared water resources of the Murray and Darling Rivers for all beneficial uses — river salinity at Morgan SA, will be maintained at less than 800 EC for 95% of the time
- To control the rise in salt loads in all tributary rivers of the Basin, and through that control, protect their water resources and aquatic ecosystems at agreed levels — meeting the end-of-valley salinity and salt load targets
- To control land degradation and protect important terrestrial ecosystems, productive farm land, cultural heritage, and built infrastructure at agreed levels Basin-wide — expressed as within-valley targets
- To maximize net benefits from salinity control across the Basin

Under the BSMS, partner governments have committed to the following nine elements of strategic action to be implemented over the next 15 years:

- Developing capacity to implement the BSMS;
- Identifying values and assets at risk;
- Setting salinity targets;
- Managing trade-offs with the available within-valley options;
- Implementing salinity and catchment management plans;
- Redesigning farming systems;
- Targeting reforestation and vegetation management;
- Constructing salt interception works; and
- Ensuring Basin-wide accountability through, evaluating, and reporting.

The implementation of the BSMS is overseen by a multilateral jurisdictional committee, the BSMS Implementation Working Group (BSMS IWG) including the Commonwealth, to ensure that the State governments and their Catchment Management Authorities (CMAs) are engaged to deliver the targets set in the BSMS. Current works and measures of salt interception and catchment actions are to deliver 61 EC and 10 EC respectively by 2015.

The Independent Audit Group for Salinity

Schedule C provides for the appointment of '*independent auditors*' to undertake an annual audit of the implementation of Schedule C provisions by the partner governments and the Commission's implementation of Salinity Registers A & B. The auditors are required to report on their findings of each audit to the Ministerial Council and any recommendations arising from that audit. To date, the Independent Audit Group (IAG) has carried out audits for the 2002-03 and 2003-04 years.

Response to the Inquiry's Terms of Reference

In the submission, the Commission wishes to highlight the linkage between the achievement of the BSMS objectives and the community catchment action plans funded by NAP and NHT and draw the inquiry committee's attention to issues raised by the Independent Audit Group for Salinity (IAG) in their 2002-2003 and 2003-2004 reports to the MDBC Ministerial Council. In addition, reference is made to the Australian National Audit Office's report on *The Administration of the National Action Plan for Salinity and Water Quality.* The Commission also reiterates the multilateral arrangements it has with its partner governments, including the Australian Government, in its submission to the House of Representatives Standing Committee on Science and Innovation Inquiry on *Science Overcoming Salinity: Coordinating and extending the science to address the nation's salinity problem.*

Terms of Reference

(a) Whether goals of national programs to address salinity have been attained, including those stated in the national Action Plan for Salinity and Water Quality, National Heritage Trust and National Landcare programs;

The Commission has a role and responsibility to ensure delivery of agreed salinity targets. NAP & NHT have goals which are congruent with those of MDBC salinity targets to deliver salinity outcomes at the local community and regional scale. The NAP Intergovernmental Agreements between the Australian Government and the States required this to occur as does the BSMS. However, the MDBC does not have a direct role to ensure delivery of NAP & NHT goals, the success of which impacts on the Basin's salinity targets. For instance, regional catchment action within the Murray-Darling Basin (MDB) is to deliver 10EC, with many actions depending on NAP & NHT achieving their goals.

The NAP, NHT, and other federal government programs that fund landscape and landuse changes are an important cog in achieving the end-of-valley targets that have been set. The MDBC has endeavoured to maximise its investment through the BSMS and regional plans. Meeting the end-of-valley targets is the key to the success of the BSMS. Hence, the linkages between the MDBC BSMS and NAP/NHT need to be strong to ensure outcomes are achieved for both programs.

The BSMS is a coordinated framework for implementing actions that will result in maintaining salinity at Morgan SA below 800 EC for 95% of the time and at end of valley sites. Catchment plans are expected to meet with NAP needs, the BSMS, and State initiatives by setting targets and recording these on the Salinity Registers. The BSMS objectives stated above (p5) are a focus for directing investment to where it is needed within the Basin for managing salinity. It has provided the framework for the partner states to develop their NAP plans for investment in natural resource outcomes for the management of salinity and water quality. For example, salt interception schemes in the SA Mallee region has been part funded by $35m from NAP, the salinity credits of which will be shared by SA and its jurisdictional partners. Other examples are the investments of NHT funds in cooperation with the state natural resources department and industry bodies in investigating the extent and nature of salinity and extending that knowledge in the Queensland part of the MDB.

Actions to meet some of the objectives are being supported through the regional investment plans identified by NAP and NHT and delivered by CMAs and State regional programs. These actions jointly with the MDBC investment are expected to deliver 61 EC from salt interception works in irrigated catchments and 10 EC from land use and environmental change within the dryland catchments of the Basin. The NAP was '*designed to build on the work established under ... the Murray-Darling Basin Commission ...*' (p50 para 2.51 Australian National Audit Office (ANAO) Report 2004). Explicit linkages between NAP and MDBC programs would help to ensure the 71 EC target is achieved.

The Independent Audit Group for Salinity (IAG) in its 2002-2003 report stated "*The IAG is concerned that the achievement of BSMS objectives may be at risk due to a lack of explicit congruence of the BSMS end-of-valley targets and actions identified in the regional plans*" and recommended that the "*program of actions are reflected explicitly in the regional plans for each state*".

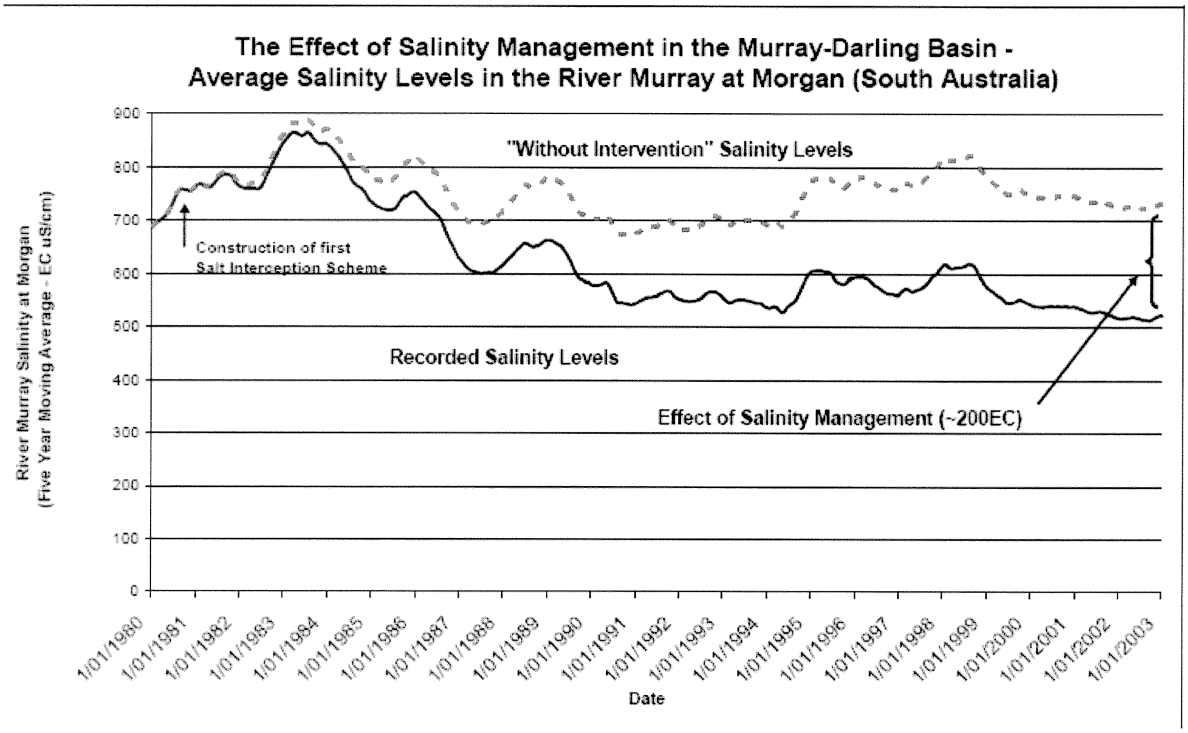
While progress has been made, the IAG commented in its 2003-2004 report to the MDBC Ministerial Council that in relation to capacity development for regional implementation "*it is already clear that the timeframes associated with development*

of regional institutional arrangements ...have delayed implementation activities" of the BSMS. Reasons for this delay are outlined in the ANAO report in 2004 on the administration of the NAP. A major reason is the length of time taken to negotiate the intergovernmental agreements between the Commonwealth and the States.

While there have been delays in the implementation of BSMS and NAP programs, it should be pointed out that any changes in salinity observed may only occur after the NAP/NHT programs have ceased. The response in the landscape and catchments are gradual and in some landscapes occur after significant time delays in the order of 5 – 40 years. In this scenario, other tools are needed to indicate the success or otherwise of the programs eg. Modelling backed up by monitoring and regular reviews. Reviews are an integral part in implementing the BSMS, where each valley and Register entry are reviewed once every five years. This is supported by the annual audit by the IAG and a Basin wide mid term review in 2007.

Progress has been made, however, in substantially reducing the impact of salinity in the river by 200 EC at Morgan, SA due to jointly funded works by the partner States, Commonwealth, and the MDBC (Figure 1 below).

Figure 1 The Effect of Salinity Management in the Murray-Darling Basin (from http://www.mdbc.gov.au/naturalresources/salinity/pdf/salinityUpdate2003.pdf)



The MDBC continues to invest in understanding the salinity process and the development of assessment techniques to determine the likely salinity impact of actions. There have been significant achievements in developing models for predicting salinity within catchments, in the river valleys, and the impact of irrigation development on in-stream salinity, particularly the Basin target at Morgan, SA, also in implementing catchment plans. Examples of such models are:

- SIMRAT – a rapid assessment tool for predicting the salinity impact of water trade within the TriState Mallee Zone. This model has been accredited by the MDBC
- 2C project – development of a catchment based modelling framework developed by experts in Qld, NSW, and Vic. The models developed under the framework are currently being tested across catchments of the MDB. The intention is to apply these models across the Basin to assess the impacts of catchment actions.
- MSM-BigMod – the MDBC accredited model used by the MDBC for evaluating the impacts (including cost of the impacts) of changed flow and salinity management on river salinity for calculating salinity credit/debits for entry to Salinity Registers A & B required under Schedule C.

Another important aspect is the communication of the positive achievements and challenges related to implementing the BSMS. A BSMS communications plan has been developed to assist the delivery of consistent and factual salinity information across the Basin. Involving the partner governments has been integral in developing and implementing the plan.

Terms of Reference (b)

(b) The role that regional catchment management authorities are required to play in management of salinity-affected areas, and the legislative and financial support available to assist them in achieving national goals;

In relation to part (b), the MDBC recognizes the important role that CMAs are now being asked to play and the importance of NAP arrangements via the bilateral agreements with the States. The MDBC interacts with the jurisdictional partners and CMAs to deliver its salinity strategy. However, it does not have a direct specified role with the CMA in formulating their catchment strategies.

Terms of Reference (c)

(c) What action has been taken as a result of recommendations made by the House of Representatives' Science and Innovation Committee's inquiry 'Science overcoming salinity; Coordinating and extending the science to address the nation's salinity problem', and how those recommendations may be furthered to assist land-holders , regional managers and affected communities to address and reduce the problems of salinity.

The MDBC responded to the House of Representative inquiry into the *Science of Salinity* emphasising in the submission the multilateral role of the Commission with partner governments including the Australian Government for implementing actions and that policies for managing salinity was developed based on well researched science.

While the MDBC has no active role in implementing the recommendations of the "*Science Overcoming Salinity: Coordinating and extending the science to address the nation's salinity problem*" it continues to pursue its multilateral cooperative approach in ensuring that salinity policy and actions continue to be based on sound science. In supporting this statement, the MDBC would like to emphasise some important points made to the House of Representative inquiry giving rise to the *Science Overcoming Salinity* report. These are listed below:

Use of salinity science base and research data in the management, coordination, and implementation of salinity programs

Since the 1980's, the Murray-Darling Basin Commission has been heavily involved in evidence-based decision making and targeted investment in natural resource particularly salinity management. The Commission's activities are developed and negotiated within a multi-jurisdictional framework which includes the Commonwealth. The Commonwealth is an equal partner in supporting and directing the Commission's knowledge (science) activities that have supported the BSMS.

Contribution to science - The Australian Government has been instrumental in the development of science and innovation on which the MDBC has drawn and partnered including the National Dryland Salinity Program; National Land and Water Resources Audit and the Commonwealth's Cooperative Research Centre Program e.g. Catchment Hydrology, Plant-based Management of Dryland Salinity. Each of these initiatives has contributed significantly to salinity management through broad ranging research across environmental, engineering, social, and economic domains; provision of data and information; and developing predictive modelling capacity. Australia is better placed to target management interventions based on process understanding and thereby can develop and test appropriate management options.

Aside from communication material, the MDBC supports knowledge transfer through its partnerships with Government, State Agencies, Industry, Regional Organisations, and Basin Communities. Partnership arrangements are implemented through inter-jurisdictional projects and working groups. Commission working groups through their multi-lateral nature provide a strong coordinating context and allow for rapid dissemination of research and data across jurisdictions and agencies.

Targets and monitoring – Additional knowledge and modelling tools are required to assist Catchment Management Authorities to meet the agreed salinity management requirements for catchment strategies and plans to deliver on End-of-Valley salinity and salt load targets. Since the inquiry, tributary models have been developed and accredited for use in assessing Baseline Conditions (as at 1 January 2000) for end-of-valley salinity, salt load, and flow regimes.

Current work is being undertaken to determine:

- expected "legacy of history" impacts on end-of-valley salinity, salt load and flow regimes for 2015, 2050 and 2100;
- effects of significant in-valley actions undertaken to date, including effects of catchment management plans on end-of-valley salinity, salt load and flow regimes for 2015, 2050 and 2100.

Computer models being developed by the partner governments and Commission will assist in meeting the objectives listed above. Each model is required to be accredited as *'fit for purpose'* by the Commission following an impartial peer review. In addition, the Commission has held three successful modelling forums, the most recent held in April 2005. The forums focussed on sharing knowledge and building networks of modellers, policy people, and managers responsible for implementing salinity management actions across the Basin.

The Commission uses modelling to assign salinity credits and debits to Salinity Registers A & B according to Schedule C to the MDB Agreement. Such credit and debits are attributed to the States who have to maintain the Registers in credit.

There are specific requirements in Schedule C that specify the obligation for reviews of each tributary valley and each Salinity Register item at least once every five years. Several reviews are due to be completed during 2005. The outcomes of these reviews, which are peer reviewed to ensure rigour, will improve our understanding of the nature and extent of the salinity threat into the future.

Conclusions

NAP, NHT and other Commonwealth programs that support a change in landuse and practice are vital in assisting the MDBC and partner governments to achieve the targets set in the BSMS. The MDBC supports a stronger requirement of NAP and other federal programs to be tightly integrated with the Commission's targets at Morgan and end-of-valley.

However, NAP/NHT has enabled the necessary investments to be made by the States and regional authorities in managing the extent and economic effects of salinity within the MDB. Tangible evidence of the outcomes of such investment can and will continue to be seen in the salinity levels at Morgan, SA and the States' end-of-valley targets.

The MDBC has continued to invest in salinity science and put that research into effect. Implementing the recommendations of the '*Science overcoming Salinity*' report by the responsible governments would assist the MDBC in basing salinity management policy on sound science and in extending it to the States and Basin communities.

Recommendation

The inquiry may like to consider the means of ensuring that the NAP & NHT deliver on shared outcomes of the BSMS.

References

Report of the Independent Audit Group for Salinity 2002-03. Murray Darling Basin Commission, November 2004.

Report of the Independent Audit Group for Salinity 2003-04. Murray Darling Basin Commission, April 2005.

ANAO Audit Report No. 17 2004-05. *The Administration of the National Action Plan for Salinity and Water Quality Commonwealth* of Australia 2004

http://www.mdbc.gov.au/naturalresources/salinity/pdf/salinityUpdate2003.pdf