

**Goulburn Broken Catchment Management Authority's
response to the "Independent Review of the Environmental
Aspects of Northern Victoria's Surface Drainage Programs in
Irrigation Areas" (Nolan Review).**

The Goulburn Broken Catchment Management Authority (GBCMA) is gratified that the overall findings of the independent review are extremely positive towards the surface drainage programs. This is a reflection of the strong contribution from agency staff and community members to sound integrated catchment management that considers economic, social and environmental outcomes.

The review also recognises the need for surface drainage in irrigation areas and describes how it is an integral component of land and water management plans in Victoria and other parts of Australia. This validates the importance of the programs and strategies in place and the need to continue implementation of these to ensure beneficial long term outcomes.

The consultant's key recommendations are outlined in the Summary Report and the Executive Summary of the review document. Following are the GBCMA's responses to each of these key recommendations. A number of other recommendations exist in section 14 or within the main body of the review document, these have also been addressed here.

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Key Recommendations

The following are the key recommendations that were contained in the consultants summary report and executive summary of the review document along with the GB CMA response to each.

Key Recommendation 1:

The revised surface drainage strategies, currently being prepared for the SIR and the Loddon-Murray irrigation areas be integrated with the water quality, farm, and bio-diversity programs. This is necessary to maximise the environmental benefits of drainage. Also, it is imperative that the environmental benefits of the revised strategies exceed the environmental costs

Response:

The CMA, DPI and G-MW have historically worked closely to ensure that all programs, including the drainage program, are fully integrated and this will continue to happen. This is considered a strength of the partnership approach adopted by the agencies involved in integrated catchment management in the Goulburn Broken catchment and the dedicated and professional approach taken by those agencies.

The Shepparton Irrigation Region Surface Water Management Strategy Review (SIRSWMSR) September 2002 addresses this recommendation by describing the linkages between programs. The CMA, DPI and G-MW were key contributors to the review and abide by the strategies in place ensuring programs across all agencies are integrated.

The Shepparton Irrigation Region Catchment Strategy (SIRCS) details the importance and need for integration and ensures all programs are integrated.

All projects are thoroughly analysed to ensure the benefits exceed the costs. Economists are involved in project development and use the appropriate tools to ensure this occurs. The environmental assessment process utilised by the program also ensures benefits exceed costs and that environmental "Net Gains" are achieved in all drainage catchments.

Key Recommendation 2:

NRE in consultation with the EPA develop improved accountability arrangements for plan implementation and water quality outcomes by:

- (a) *Developing a licensing arrangement between the EPA, or the CMAs via delegation for the EPA and G-MW regarding discharge of drainage water to receiving surface waters (an operating agreement may be considered adequate although a licence is considered most appropriate). Innovative licensing arrangements based around water quality goals and independent performance review processes. Water quality goals should be established based upon the up-take of best nutrient management practices, drainage re-use systems, water use efficiency measures, and other agreed measures.*
- (b) *Strengthening operating agreements to include goals, outcomes and operating arrangements between NRE (CAW) and the CMA, G-MW, NRE (CAW), NRE (CAS), and NRE (PFF).*

Response:

Key agencies involved in the management of irrigation drainage and water quality in Northern Victoria (DSE, EPA, GBCMA, NCCMA and G-MW) agreed that a "High Level Operating Agreement", now referred to as the Memorandum of Understanding for Irrigation Drainage Management and Water Quality (IDMOU), would be the most appropriate way to address this recommendation. The IDMOU has been developed and in June 2004 it was signed by the key agencies.

Implementation of the IDMOU is progressing to plan with the development of a Rapid Decision Support System (DSS) which is expected to be completed by the end of March 2005. This will provide a framework and method for identifying the most appropriate points to monitor water quality, for setting interim targets and implementation of activities. These will eventually be replaced with final targets using a more comprehensive and detailed DSS. This will ensure continuous improvement of the program and result in substantial environmental outcomes being achieved.

The CMA believe this approach to be far superior to introducing licensing arrangements which it considers would be counter productive to the adoption of activities that would result in environmental improvements for the program and the region. Licensing is considered cumbersome and requires significant resources to manage, audit and enforce. In addition to this change, management is only truly effective if the individuals involved understand the concepts and can identify the benefits.

Key Recommendation 3:

NRE work with the North Central CMA to strengthen program implementation arrangements in the Loddon-Murray irrigation areas, including a more rigorous approach to applying the environmental assessment procedures.

Response:

NCCMA specific, not relevant to GBCMA

Key Recommendation 4:

NRE work with the North Central and Goulburn-Broken CMAs to ensure that appropriate arrangements are in place to effectively and efficiently integrate SMPs and water quality strategies on a catchment basis.

Response:

See response to recommendation 1.

Key Recommendation 5:

The second generation SMPs currently under development allow for the full integration of water quality and native vegetation strategy implementation on a drainage catchment basis. This should include establishing water quality and other environmental goals as key performance measures. In particular, there is a need for unified implementation arrangements for salinity and nutrient management.

Response:

The IDMOU addresses water quality on a catchment basis by setting targets using risk based and adaptive management approaches. Performance indicators for resource condition and management practices will also be set through the IDMOU process to ensure environmental, economic and social outcomes are met and continually improved. An audit framework and performance review process has been established to ensure water quality outcomes are achieved in an impartial manner. Responsibility for all of these actions have been established and through the signing of the IDMOU agreed to by all key stakeholders.

Catchment and asset operation plans will be developed which relate to surface drain and farm scale operations.

The GBCMA has developed a Monitoring, Evaluation and Reporting Strategy for integrated Natural Resource Management in the GB catchment. This strategy has been developed to ensure natural resource management in the GB is monitored and evaluated comprehensively, efficiently and cost effectively. Information on natural resources and their management is readily available to ensure that the community is well informed and decisions are based on the best available environmental, economic and social data.

Further integration of programs is achieved through the yearly Regional Catchment Investment Plan (RCIP) process. The RCIP aims to document the links between the various strategies and programs and provides a framework for integration, targeting, prioritisation and funding of projects. Annual community priorities and funding constraints are considered in producing the document along with achievements against goals.

Key Recommendation 6:

The EPA in partnership with NRE, CMAs and G-MW establish processes to ensure the independent scrutiny of water quality monitoring programs, trend evaluation methodology, evaluation of monitoring results, and annual reporting.

Response:

The CMA believes that the responsibility for delivery of this rests with DSE. This is reflected in the IDMOU, which describes key stakeholder responsibilities. Development of frameworks for monitoring and evaluation, and the statewide responsibility to monitor the quantity and quality of water in waterways of the state are clearly assigned to DSE.

In addition to this, the EPA and DSE have representation on the IDMOU steering committee and the development and implementation of the DSS which addresses the key aspects of this recommendation. The CMA is satisfied that the development of the DSS is satisfactorily considering the components of this recommendation.

Key Recommendation 7:

Water quality goals be specified against which monitoring data is evaluated.

Response:

The Shepparton Irrigation Region Land and Water Management Plan sets goals through a consultative process with DSE and the CMA. Monitoring is assessed in relation to these goals. A component of this is the 5 year review process employed to ensure strategy outcomes are being met. The last review of this process was completed in 2002.

In addition to this the IDMOU through the DSS process will ensure integration in relation to this recommendation such that water quality can be clearly measured and easily related to goals.

Key Recommendation 8:

G-MW has responsibility for all future irrigation drainage outfalls, to provide for better management of water quality at the outfall and be responsible for compliance water quality monitoring.

Response:

This recommendation has been adopted as policy and applied to all future schemes. This policy does not apply to existing schemes.

Key Recommendation 9:

Commonwealth and State Governments resolve the process for determining compliance with assessment procedures under the Commonwealth EP&BC Act.

Response:

DSE has taken responsibility for this recommendation in their response to government. DSE will develop a process for addressing the Environment Protection and Bio-diversity Conservation Act in consultation with the CMA's, the Department of Infrastructure and the EPA.

The CMA welcome the development of this process and consider it to be essential. The present Act has no way of dealing adequately with environmental protection activities. Works to protect one environmental feature or process may negatively impact on another, thus trade-offs are essential. The present EPBC Act cannot account for this.

In the interim the CMA will ensure that all SWM projects comply as fully with the EPBC Act as possible. Clauses have been included on work specification plans, whole farm plans and other agreements with landowners that specifically state that all actions must comply with the EPBC Act.

In addition to this an assessment of new projects is made to determine if the EPBC Act is "triggered". If so a formal referral is made to ensure that the appropriate process is followed.

Key Recommendation 10:

Specifically target native vegetation re-establishment in surface drainage protected areas as part of the integrated drainage catchment management plans.

Response:

The environmental assessment process employed by the surface water management programs ensures that areas suited to native vegetation re-establishment are identified and targeted for works. This process also identifies areas that would benefit from targeted protection and enhancement.

To ensure that all projects complement Victoria's Native Vegetation Management Framework, a Net Gain Analysis is now conducted for all SWM proposals.

Avoiding native vegetation is a key component of the survey and design process for all SWMS proposals. DPI, DSE, G-MW and SWMS designers are involved in extensive alignment negotiations throughout a project's feasibility and design stages in order to avoid native vegetation where possible. The restoration of any removed native vegetation is a high priority for all SWMS projects. Where native vegetation is removed the principles of the Net Gain policy will underpin the identification of these works.

Further more the surface drainage programs are comprehensively integrated with the Environmental Management Program. Processes are in place to ensure native vegetation is considered in all projects. A specific environmental position has been created within the community surface water management program to further enhance opportunities for targeting native vegetation re-establishment and the protection of existing assets ensuring this recommendation is adhered to.

An example of how this recommendation is being addressed by the program is the Muckatah Surface Water Management System. An integral component of this system was the enhancement of the environmental features of the catchment by protecting and improving existing assets and re-vegetating the catchment. This was achieved through the identification of assets during the design stage and integrating protection, enhancement and re-vegetation activities as an integral component of the project.

Key Recommendation 11:

Develop and implement appropriate arrangements such as formal agreements, operational management plans, and incentives to protect and enhance remnant vegetation and wetland on private land, which is benefiting from drainage.

Response:

The environmental assessment process employed by the programs identify all wetlands and remnant vegetation within a drainage catchment and considers their requirements in the design phase of the project.

The program provides funds to maximise the positive impact on every wetland and provides for the construction of structures for appropriate wetting and drying regimes. Drains are constructed and managed in such a way as to re-establish the natural wetting and drying regimes.

A process of establishing cooperative management plans for areas of high environmental value are adopted by the programs to ensure the operation of surface water management systems protects and enhances wetlands and native vegetation.

A range of incentives are in place to address the protection of environmental assets including native vegetation and wetlands. The rate of incentive provided is linked with implementing all aspects of the strategy using a matrix system.

The program also provides a significant extension effort to change the attitudes of landowners in relation to the values of wetlands and native vegetation.

Environmental water has been used to protect and enhance wetlands and associated remnant vegetation for the past 5 years. Monitoring of the impacts has also taken place. A proposal has been developed by the program to seek additional environmental water in the form of water rights.

A workshop has been held to consider and progress the issue of formal agreements and ongoing controls.

Clauses have been included on work specification plans, whole farm plans and other agreements with landowners that specifically state that all actions must comply with the EPBC Act.

Drain management operation plans and asset operational plans are now prepared to ensure the operation of drains meet the requirements of the design regarding the protection and/or enhancement of environmental features.

Key Recommendation 12:

Devise an approvals process and management arrangements to improve the rigour applied to monitoring water quality from CSD outfalls to rivers and wetlands.

Response:

The IDMOU through the DSS process will ensure this recommendation is being addressed. Specific outfalls or river reaches will be monitored to ensure water quality can be scrutinised in relation to CSWMS outfalls.

The CMA believes that strict approval processes for both programs already existed prior to the IDMOU including an established monitoring framework. The IDMOU will strengthen this process.

Key Recommendation 13:

Undertake periodical, independent auditing of program implementation.

Response:

An audit framework has been developed as part of the IDMOU. A range of auditing tools have been identified and agreed to by the partner organisations through this process. This includes a system of audits to ensure probity of performance can be assured. Where less than desirable water quality outcomes occur special catchment analyses or independent catchment investigations will be commissioned. In addition to this an independent performance review will be performed on a 5 yearly basis. This will assess performance against water quality outcomes along with assessment of the processes being adopted and implemented as part of the IDMOU.

In addition to this, there is a 5 yearly review process to ensure strategy outcomes are being met and this has been employed since the Land and Water Management Plans were developed in the late 1980's. The last review was completed in 2002 and another is due next year.

Key Recommendation 14:

As new information and approaches become available, retrofit older drains to reduce outfall nutrient loads and rehabilitate wetlands.

Response:

This recommendation was addressed in the 2002 Surface Water Management Strategy Review. The review specifically states that an allowance be made for retrofitting of existing drains. Funds totaling \$3.1 million have been allocated for these works to be undertaken by the end of 2009/10 financial year. An outcome of this has been the addition of retrofitting in the RCS. Investigations into the first sub-catchment considered for retrofitting is currently underway as part of the SIRSWS implementation.

Additional recommendations

The following are other additional recommendations that were captured in section 14 or within the main body of the review document along with the GB CMA response to each.

Additional Recommendation 1:

Regulations, Policies , Roles and Responsibilities

The approach used to estimate salinity debits for reporting to MDBC as part of the salinity and drainage strategy be amended using current information and knowledge rather than using historic average salt loads per constructed drain length.

Response:

The current approach to estimating the salt disposal impacts resulting from the installation of primary and community drains is to use average impacts (Salt Disposal Entitlement per km of drain) based on the impacts originally estimated during the development of the SIRLWSMP. We recognise that this is a crude approach and are working on developing more effective ways of estimating the salt disposal impacts.

At present an audit of the SIR salt disposal impacts is being developed for the MDBC. This includes modeling work that is hoped will provide a more superior technique to estimating the impact of drains. The first objective of this work is to perform the audit, after which it is not expected to take much effort to consider specific drain construction impacts. The audit is expected to be completed this financial year (2004/05). At present, the audit project is the only work being done that will refine the current approach to estimating the salt disposal impacts due to drain installation.

However, it should be acknowledged that the overall drain installation in the SIR does not have a very high salt disposal impact. The majority of the SIR impact is due to subsurface drainage works.

Additional Recommendation 2:

Drainage program planning

The multi-criteria approach currently being used to assess drainage priorities be reviewed to strengthen environmental considerations, including the full consideration of downstream water quality impacts. The importance of environmental features associated with proposed drainage schemes should be highlighted in terms of its regional context, as well as its state or national context. Information should be given quantitatively where it is available.

Response:

The 2002 Surface Water Management Strategy Review addresses this recommendation by describing the prioritisation of works being based on a weightings approach with the parameters used and the weightings adopted being:

- Economic 55%
- Environment 25%
- Community response factor 20%

The environmental weighting has increased to 25% under this strategy from the previously used multi-criteria rating index which assigned a weighting of 10% to the environment.

In addition to this it is State and Federal Government policy that economic, environmental, and social aspects of projects are given consideration when assessing priorities. This assessment complies with relevant legislation, policies and guidelines that are considered to be best practice in the Australian and International context. The 2002 Strategy Review further addresses this recommendation and describes the environmental assessment procedure employed by the SWMP as based on a four tiered approach, that is:

1. All work performed in the SIR, and hence the SWMP is a component of the Government approved Land and Water Management Plan which is a component of the Regional Catchment Strategy.
2. An Integrated Surface Water Management Strategy exists under the umbrella of the RCS.
3. A two staged Environmental Assessment process as outlined in NRE's *Environmental Assessment Procedure for Integrated Surface Water Management* (1999) is used.
4. An on-going commitment to supporting the community groups implementing the Surface Water Management Strategies.

This ensures that environmental factors are addressed throughout implementation of the program.

The integrated approach employed by the program and other stakeholder agencies involved in NRM along with the RCS ensures consideration of downstream water quality impacts and the regional, state and national importance of environmental features.

All CSWMS projects are required to obtain a planning permit from the relevant authority before proceeding. This provides an additional level of scrutiny in terms of the regional and state context. Various referral authorities have the ability to address issues of concern in relation to a range of aspects before the project proceeds. This ensures cultural, environmental and social aspects of the project are further scrutinised.

Additional Recommendation 3:

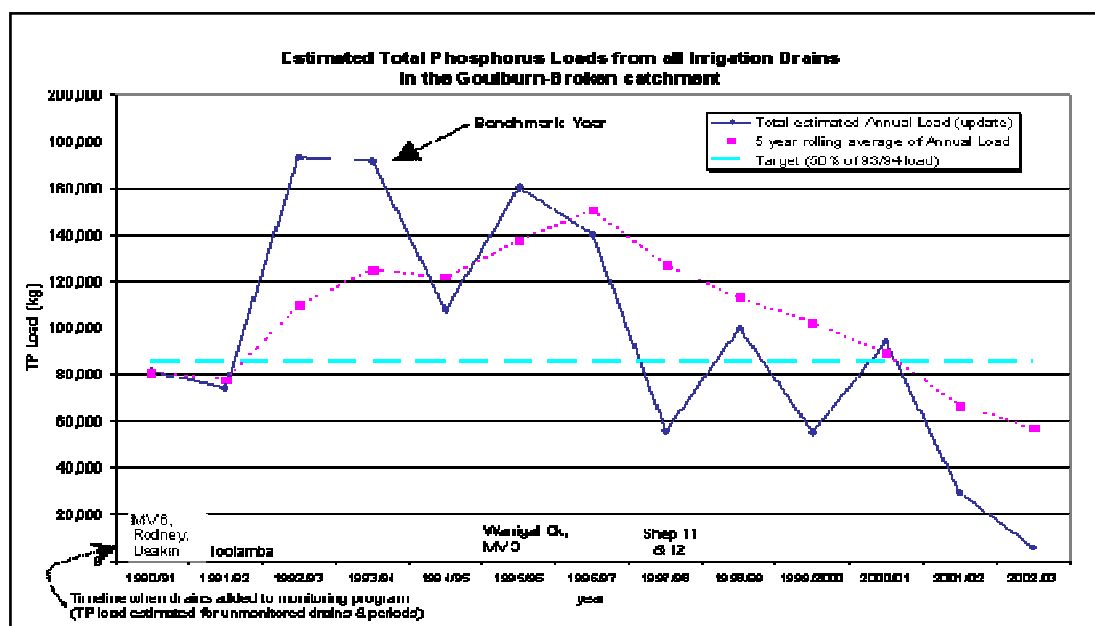
Design and approval processes and practices

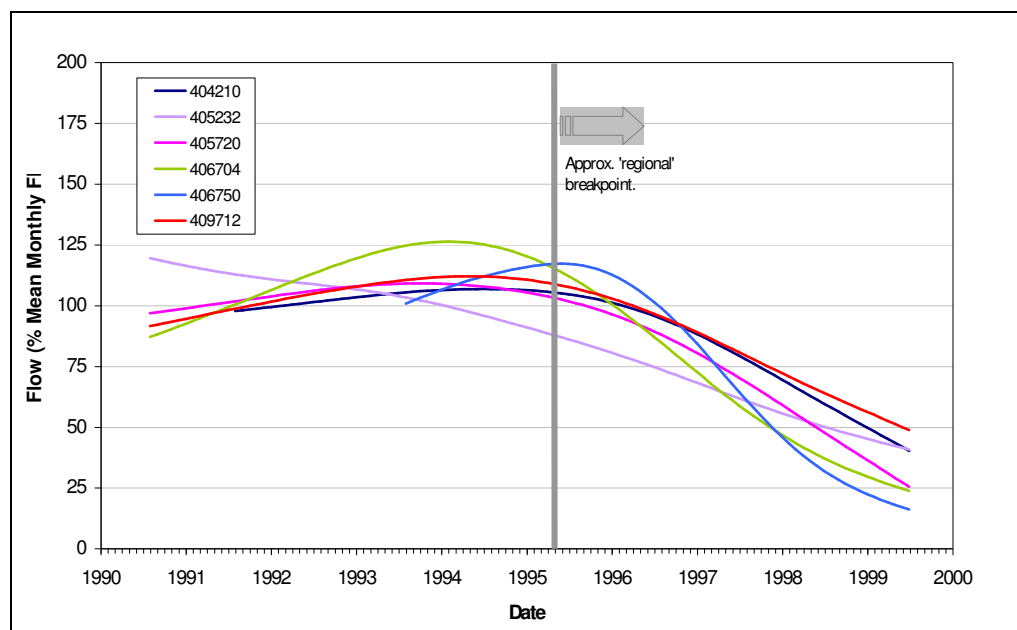
Drainage programs continue to develop the objective of eliminating irrigation runoff to reduce nutrient discharge into drains and to minimise drainage outfalls. This requires further work to resolve the dilemma of reducing drainage into drains whilst catering for the needs of downstream users.

Response:

The GB nutrient management strategy addresses nutrient discharges and encourages innovative approaches to tackling this issue. Included in the strategy or coupled to it through other programs are a number of significant actions that address the issue of nutrients, including whole farm planning, irrigation re-uses systems, automatic irrigation and water harvesting. Further more the Target 10 dairy program develop and implement courses which address management of nutrients on farm to improve productivity and reduce the amount of nutrients lost in drainage.

These projects are an integrated package of works being implemented and continually improved to achieve environmental outcomes, including the elimination of irrigation runoff. Monitoring of water quality and drainage flows demonstrates that the works being implemented are reducing nutrient discharges to drains. Drain flows have trended down along with levels of nutrients in drains leaving the SIR. This is demonstrated in the following graphs:





This can be partly attributed to the package of works being implemented in the SIR. This includes irrigation re-use systems, which have been well adopted. In addition to this landowners are being encouraged to install water harvesting storage's along drains. This allows strategic removal of water from drains reducing nutrient impacts whilst catering for downstream uses by allowing water to be used, in some cases multiple times. The result is a reduction of irrigation runoff entering waterways.

The present mix of economic drivers, incentives, extension and existing regulation have all aided the uptake of works being offered by the CMA which is continually reducing flows and nutrient loads leaving catchments.

Additional Recommendation 4:

Design and approval processes and practices

The adopted design and approval standards be applied with equal rigour across the entire GMID. The guidelines should include specific instructions regarding the circumstances where, based on environmental impacts, the standards may be relaxed and how this is to be recorded.

Response:

The GBCMA believes this recommendation was in reference to the NCCMA.

The GBCMA has consistent design, approval standards and environmental assessment across the programs. Program forums such as CSDCC and SWMWG develop and consider requests such as these and approve them or otherwise after consideration of the economic, social and environmental impacts. This is then documented in the respective manuals for that particular forum. There are processes and guidelines in place so that when developing papers for these forums the

economic, social and environmental aspects are considered. Similarly there are opportunities for the NCCMA to adopt and build on the existing guidelines as part of the implementation of the LMSWMS.

Additional Recommendation 5:

Design and approval processes and practices

The primary drain design procedures currently being developed by G-MW, termed the Design Guidelines for Surface Water Management Schemes, be endorsed and applied as soon as possible. They should then be regularly reviewed to reflect developments in drainage design, implementation, management and community expectations.

Response:

The design guidelines have been drafted and comments sought. A final version is currently being developed taking into consideration comments from stakeholders. The final version is expected to be ready for endorsement by the end of the financial year (2004/05).

Additional Recommendation 6:

Design and approval processes and practices

The environmental assessment documentation include summary of environmental benefits/dis-benefits. There should be a post construction review. This should include documenting the processes for implementing the program to demonstrate compliance with policies and guidelines. The reasons and approvals for non-compliance should also be clearly documented.

Response:

The State and Federal governments require proposed SWMS to take into account environmental issues during the planning phase. The environmental assessment procedures comply with relevant legislation, policies and guidelines that are considered to be best practice in the Australian and International context.

The environmental assessment process:

- a) Describes the environmental values remaining in natural and semi-natural ecosystems throughout the catchment,
- b) Identifies the threats (in relation to SWMS) that may be impacting on the environmental values identified during the assessment, and
- c) Advises the interested parties on means of protecting and enhancing the ecological/biodiversity values of a catchment.

A fundamental purpose of this process is to identify, protect and enhance key environmental assets from further degradation leading to “net gain”.

The environmental assessment of a catchment is the beginning of a process of ongoing environmental input and negotiation, as such officers from the CMA, DPI and its predecessors have continual involvement in projects.

The environmental assessment process described does include documentation of the environmental benefits/dis-benefits. In addition processes for implementing the program are currently well documented and repeating these in a post construction review would only result in duplication.

The 5 yearly review process performed to ensure strategy outcomes are being met, documents the processes for implementing the program and demonstrates compliance with policies and guidelines. This process has been employed since the Land and Water Management Plans were developed in the late 1980's. The last review was completed in 2002 and another is due this year.

In situations where the operation and management of SWMS are being transferred to G-MW final inspections of constructed projects are undertaken by EMP as part of due diligence process. This ensures that EA recommendations for the particular project have been adopted. This information is included in the final report for the project.

Additional Recommendation 7:

Construction management

Completion of environmental and wetlands projects to agreed design and time lines be a condition of scheme approval.

Response:

This is a strength of the Surface Water Management Program. Environmental and wetland issues are considered during the survey and design phase through involvement of the Environmental Management Program and their recommendations are factored into the design of all projects. Engineering works are constructed as part of the project and other aspects are implemented as soon as possible. Both EMP and the Environmental Grants Officer use techniques to ensure other environmental works are considered and implemented by landholders. CSWMS are not approved and will not receive funding unless environmental and wetland projects are constructed to design.

Additional Recommendation 8:

Management, Operation and Maintenance

The management, operation and maintenance of CSD's be improved with clearer delineation of responsibilities, with ongoing support from NRE.

Response:

Clear delineation exists as to the responsibilities of ongoing management, operation and maintenance of CSWMS. Groups now have two distinct options when considering the management, operation and maintenance of the surface water management system:

1. G-MW option. Group agree to allowing G-MW to lease the drain for a period of 200 years. G-MW is responsible for the management, operation and maintenance of the system.
2. Landowner group management. Groups still have the option of managing, operating and maintaining the system themselves under provisions in the Water Act, that is a legal agreement is developed between involved individuals.

The CSWMP has a maintenance manual available for all CSWMS that details the requirements to appropriately manage a system.

The IDMOU will also strengthen the management and operation of systems through the development of operation plans. These plans will capture any operation and management requirements relating to significant environmental, cultural or heritage features in the serviced area. These will be adhered to by system operators or landowners to ensure significant features are protected as agreed.

Additional Recommendation 9:

Drain Catchment Management

Continuing research into benefits and costs of on-farm adoption of a range of sediment and pesticide trapping and nutrient harvesting schemes such as filter strips, vegetated waterways, retention basins (especially for more extensive farm systems and where there is cropping or vegetable growing) be undertaken. The research should focus on farming systems that may have a higher risk of generating pollutants (sediments, nutrients or pesticides) such as vegetable growing and cropping.

Response:

A range of work has been performed looking at runoff from dairy pastures. A number of publications have been produced, most notably the Best Management Practices (BMP) for irrigated pastures which addressed the issue of nutrients leaving farms in irrigation water. The BMP booklet, a culmination of research work, provided landholders with the tools to reduce the amount of nutrients lost in irrigation water.

Other projects that are currently being pursued relating to this recommendation include:

- Investigating the use of market based instruments as a driver for practice change. This project aims to establish a trial market for Phosphorus trading with the intention of encouraging improved management by placing an additional value on the element. For this concept to be effective a monitoring program to track compliance and evaluate effectiveness would be required. The project is currently

in the development stage with the design of a trial market expected to be completed by July 2005. The market will then be implemented in a trial catchment on a test basis after this.

- A research project has been completed that considered the potential of reducing nutrients in irrigation using in-line wetland technology and batter stabilisation. An in-line wetland site has been established and a number of batter stabilisation trails using various methods have also been established in the SIR. The outcomes of the project have been adopted.

The current RCIP document includes a research and development component. This funds the ongoing R&D component of the surface and sub-surface water management program projects, including revision of the groundwater management plan, revision of monitoring requirements, investigating of new technologies, analysis of watertable behaviour, commencing a five year review, salinity budget, salt disposal review, management of C type areas and management of evaporation basins.

Additional Recommendation 10:

Monitoring Environmental Outcomes

The Victorian Mandatory Environmental Monitoring Program be strengthened to monitor a larger number a more representative range of sites to determine program effectiveness in mitigating the effects of excessive water and salinity on the environment. The monitoring should focus on identifying the overall changes in catchment health as they are drained specifying environmental goals.

Response:

The mandatory monitoring program provides a Statewide picture of the impacts of salinity on natural ecological systems. DSE is responsible for this monitoring. The GBCMA in partnership with DSE and G-MW oversee monitoring associated with the environmental effectiveness of the implementation of the salinity plans. This includes annual reporting on the progress towards achieving agreed targets. It is GBCMA's understanding that DSE will review the mandatory monitoring program as a component of the catchment strategy review.

In addition to this, a 5 yearly review process to ensure strategy outcomes are being met has been employed since the Land and Water Management Plans were developed in the late 1980's. The last review was performed in 2002 and another is due this year. This process addresses the impacts of the programs being implemented by the GBCMA and their partners including the effectiveness in mitigating the effects of excessive water and salinity on the environment.

The GBCMA has developed a Monitoring, Evaluation and Reporting Strategy for integrated Natural Resource Management in the GB catchment. This strategy has been developed to ensure natural resource management in the GB is monitored and evaluated comprehensively, efficiently and cost effectively. Information on natural resources and their management is readily available to ensure that the community is

well informed and decisions are based on the best available environmental, economic and social data.

Additional Recommendation 11:

Monitoring Environmental Outcomes

Establishing overall catchment health performance indicator and developing alternative monitoring and data generation methods

Response:

The GBCMA has developed a Monitoring, Evaluation and Reporting Strategy for integrated Natural Resource Management in the GB catchment. This strategy has been developed to ensure natural resource management in the GB is monitored and evaluated comprehensively, efficiently and cost effectively. Information on natural resources and their management is readily available to ensure that the community is well informed and decisions are based on the best available environmental, economic and social data.

In addition to this a range of key performance indicators for catchment health have been developed and captured in the Catchment Strategy. This provides targets and a mechanism for establishing catchment health performance measures and a framework for monitoring this.

In terms of water quality the IDMOU through the DSS process ensures this recommendation is being addressed. Specific outfalls or river reaches will be monitored to ensure water quality can be scrutinised in relation to all drain outfalls. Key performance indicators are being developed for water quality and catchment actions that will provide the ability to establish overall performance.

Additional Recommendation 12:

Education and Awareness Raising

A review of the comprehensiveness and approaches used by current education and awareness programs to address the high turnover of farmers and agency be undertaken.

Response:

A communications strategy is currently being developed by DPI that will consider the turnover of farmers. This document is on track to be completed by the end of June 2005 and will specifically address this issue.

Currently the program deals with high turnover by continually repeating the extension messages using a range of innovative and changing techniques to ensure new and existing landholders are aware of our programs.

Evaluation and monitoring techniques are continually being implemented by the program and refined by the evaluation advisory team to ensure that all aspects of the program are evaluated. This includes the comprehensiveness and approaches used by current education and awareness programs to address the high turnover of farmers and agencies.

In the CSWMP it is the Technical Liaison Group's responsibility to identify new landholders to the catchment. The convenor of the meeting then approaches these landholders to ensure they are fully briefed on the project.

Local solicitors also play a roll in ensuring, to some degree, this recommendation is met. Under section 32 (vendor statement) of the Sale of Land Act landowners selling properties must disclose certain information to prospective buyers. Solicitors acting on behalf of the buyer are often in contact with project officers to confirm the presence of CSWMP activities on properties. The program has also been pro-active in this regard by providing solicitors with standard letters for buyers describing the programs projects and contact details for further information.

The CSWMP has comprehensive manuals describing every key process used in the program, including a SWMO operator's manual, a design guideline manual, an administrative manual, a maintenance manual, process maps, Gantt charts and a centralised electronic archival and retrieval system including a database on every scheme. All of these documents contribute towards efficient and effective staff performance including the induction of new staff. The Primary program is currently developing similar documents.

Glossary of acronyms

BMP — Best Management Practices
CMA — Catchment Management Authority
CSD — Community Surface Drain
CSDCC — Community Surface Drainage Co-ordinating Committee
CSWMS — Community Surface Water Management System
DPI — Department of Primary Industries
DSE — Department of Sustainability and Environment
DSS — Decision Support System
EA — Environmental Assessment
EMP — Environmental Management Program
EPA — Environment Protection Authority
EPBC — Environment Protection and Biodiversity Conservation Act
GB — Goulburn Broken
GBCMA — Goulburn Broken Catchment Management Authority
GMID — Goulburn Murray Irrigation District
G-MW — Goulburn-Murray Water
MDBC — Murray Darling Basin Commission
IDMOU — Memorandum of Understanding for Irrigation Drainage Management and Water Quality
NC — North Central
NCCMA — North Central Catchment Management Authority
NRE — Department of Natural Resources and Environment
NRE (CAS) — Department of Natural Resources and Environment (Catchment and Agriculture Services Division)
NRE (CAW) — Department of Natural Resources and Environment (Catchment and Water Division)
NRE (PFF) — Department of Natural Resources and Environment (Parks, Flora and Fauna Division)
NRM — Natural Resource Management
R&D — Research and Development
RCIP — Regional Catchment Investment Plan
RCS — Regional Catchment Strategy
SIR — Shepparton Irrigation Region
SIRCS — Shepparton Irrigation Region Catchment Strategy
SIRLWSMP — Shepparton Irrigation Region Land and Water Salinity Management Plan
SIRSWMSR — Shepparton Irrigation Region Surface Water Management Strategy Review
SMP — Salinity Management Plan
SWM — Surface Water Management
SWMP — Surface Water Management Plan
SWMS — Surface Water Management System
SWMWG — Surface Water Management Working Group