



Shepparton Irrigation Region Catchment Implementation Strategy

Groundwater and Salt Management Program Research and Investigation Strategic Plan Annual Report for 2008/09

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Purpose

The purpose of this report is to present the key achievements from the Shepparton Irrigation Region Catchment Implementation Strategy (SIRCIS) Groundwater and Salt Management Program (GSMP) Research and Investigation (R&I) Strategic Plan for 2008/09.

Background

The Sub-surface Drainage Program (SSDP) R&I Strategic Plan was formulated in 2003. The R&I Strategic Plan is reviewed every five years, however new issues are fed into the R&I Strategic Plan on an annual basis and are prioritised against existing R&I Strategic Plan issues. Where appropriate the highest priority issues are translated into projects. The last revision of the SSDP R&I Strategic Plan was in 2007 and focused on the development and implementation planning of the R&I Strategic Plan for the period 2007-2011.

In late 2008, due to the significance of the changes to operating environment, a high level mid-term review was conducted and resulted in changes to the SSDP program name to the Groundwater and Salt Management Program, and to the vision, mission and objectives of the program, as well as the reprioritisation of the annual GSMP R&I Strategic Plan Program projects for period 2009-2011.

2008/09 was the sixth year of implementation of the GSMP R&I Strategic Plan.

2008/09 R&I Strategic Plan

2008/09 SSDP R&I Strategic Plan Mid-term review

In 2008/09 a mid-term high level review was undertaken due to a number of significant changes since 2007 which were expected to influence the delivery of SSDP R&I Strategic Plan program. As a response to these changes it was agreed by key agency and community stakeholders to adapt the SSDP to respond to the new operating environment. These adaptations include the following:

i) New Program name

The new name being:

Groundwater and Salt Management Program (GSMP).

ii) New Vision, Mission and Objectives

The new vision, mission and objectives are as follows:

a New GSMP Vision:

“Secure efficient, productive agriculture and improved social and environmental assets within the Shepparton Irrigation Region with limited adverse impacts beyond the Region.”

The main change to the vision was to provide an improved focus on social assets and limiting the regions impacts beyond the SIR

b New GSMP Mission:

“To work with and unite community and all government agency stakeholders to provide adaptive groundwater and salt management services which support sustainable agricultural practices, foster viable communities and improve key environmental assets across the Shepparton Irrigation Region.”

The main changes to the mission were an increased focus on the uniting of community with government agencies, and highlighted the emphasis on adaptive approach and the need to foster viable communities.

c. New GSMP Objectives:

“Within the Shepparton Irrigation Region, where economically, socially and environmentally feasible, to:

- i. Actively encourage adaptive management and innovation in improving salt and groundwater management
- ii. Effectively manage risk through understanding how and where salt is stored and mobilised in the landscape and then developing and implementing appropriate management responses.
- iii. Minimise the mobilisation of salt and its impact on downstream users and where appropriate, encourage the sustainable use of shallow groundwater.
- iv. To improve community stability and investment confidence by fostering investment opportunities, improving financial returns, optimising institutional arrangements, increasing productivity and reducing risk
- v. Encourage high levels of community awareness, capacity and involvement in the implementation of the Shepparton Irrigation Region Groundwater and Salt Management Program and its associated Catchment Programs and Strategies by all appropriate means
- vi. To support resource managers and the community in harmonising salt management and water recycling opportunities by recognising the water in the shallow Shepparton aquifers is drainage water and developing and implementing appropriate wet and dry climate cycle management arrangements
- vii. Serve key land and water resources by providing effective salt management protection for agricultural land at risk, (estimated in 2006 at 185,000 ha by 2030)
- viii. Ensure key high value environmental assets are maintained and where necessary improved, (estimated in 2006 at 22,000 ha by 2030)”

The main changes to the objectives of the GSMP were an increased emphasis on adaptive management, management of risk related to salt storage and mobilisation and water balance changes, optimising institutional arrangements, with an emphasis on the community and the environment.

iii) Future Focus

The revised program focus sees an increased emphasis on the environmental, the community and groundwater management. Table 1 shows the previous GSMP focus compared with the new endorsed focus of the GSMP R&I Strategic Plan Program

Table 1: Previous Focus (2007-2011) vs. New Focus (2009 – 2011) for the GSMP R&I Strategic Plan

Previous Focus	New Focus
a) Community Education	a) Salt management - generation
b) Strengthening Program management	- mobilisation
c) Integrate salt catchment scale planning	- impacts
d) Salt management - generation	b) Environment
- conveyance	c) Groundwater management
- impacts	(harmonisation of nuisance and resource)
e) IDG formulation	d) Communication of integrated delivery
Environment – secondary focus	

iv) Revised Project Prioritisation

As part of the mid-term review projects were reprioritised in accordance with the revised GSMP focus and drivers. New initiatives related to the uncertainty regarding salt storage and mobilisation and understanding the water balance changes in the SIR were brought to the forefront of the program for funding.

Overview of 2008/09 Plan Outputs

The key GSMP R&I Strategic Plan outputs for 2008/09 were:

- Six management and 14 implementation projects being progressed over the 2008/09 financial year
- Four new projects were brought into the program for implementation over the next three years based on new prioritisation
- Two implementation projects were completed and are detailed in **Attachment A** and **Attachment B**. The two projects were:
 - i. Project *GG06 007 Review of Potential Impact of Projected Changes in Groundwater Levels and Salinity*
 - ii. Project *GG07 041 Procedures manual for Salt Administration and Reporting in the GB CMA*
- 13 new issues were identified that could be addressed by the GSMP R&I Strategic Plan and are summarised in **Attachment C**. Seven of the new issues identified were assessed as sufficiently important to warrant inclusion in the GSMP R&I Strategic Plan. Five of the new issues identified were assessed as being able to be addressed in other projects. One issue was deemed an EPA and G-MW licensing issue not to be funded and included in the GSMP
- 12 existing projects were deemed to have similar objectives to other projects and as such were merged with those other projects. Details of merged projects are shown in **Attachment D**
- The mid-term review resulted in a refocused 5 year Strategic GSMP R&I Program being produced.

GSMP R&I Strategic Plan projects on hold

Due to the change in focus and the reprioritisation of the GSMP R&I Strategic Plan the following R&I Projects have been placed on hold:

- Project *GG07 017 Impacts of Reconfiguration and Water Trade on SSDP Assets*
- Project *GG07 033 Accounting for potential MDBC Policy Changes*
- Project *GC04 005 Review of SSDP cost shares*
- Project *GG02 028 Develop options to maximise salt credits to the region*
- Project *GI06 055 Mt Scobie Partial Conjunctive Re-use Study*
- Project *GG07 007 Strategy to ensure adequate installation of Private SSDP Assets*
- Project *GG06 031 Assessment of groundwater pump performance*

The objectives of each of these projects are detailed in **Attachment E**.

GSMP R&I Strategic Plan Achievements 2008/09

The GSMP R&I Strategic Plan was successfully managed and progressed in 2008/09. A summary of the key achievements of the GSMP R&I Strategic plan for the year is as follows:

- i. Identification of changed drivers and focus of the R&I program in the mid-term review, recognising the strengthened consideration for the environment as a primary driver
- ii. Confirmation that the original predictions for areas to have high groundwater levels by 2020 in the “Do Nothing” scenario were reasonable based on groundwater behaviour trends
- iii. Identification that climate is a major driver of watertables and the urgent need to investigate water balance changes in the SIR
- iv. Identification that the need to understand salt mobilisation processes is imperative to pre-empt impacts of salt mobilisation if there is a return to a wetter climate
- v. Development of governance arrangements for salt administration and reporting obligations for the Murray Darling Basin Authority for the GB CMA
- vi. Development of relationships and data to support the Goulburn Murray Irrigation District water supply system modernisation by Northern Victoria Irrigation Renewal Project
- vii. The Grouped Salt Projects Steering Committee (GSPSC) has been established for a number of years. Provision of an improved focus on the environment. To aid in the achievement of this goal the plan management included the establishment of separate steering committees to facilitate project coordination, similar to the Grouped Salt Projects Steering Committee (GSPSC) which was established in 2005/06. This committee is referred to as the Grouped Environmental Projects Steering Committee (GEPSC). The GESPC was a positive 2008/09 initiative.

More detailed project outcomes from the completed projects are detailed in **Attachment B**.

Financial Progress 2008/09 assistance

The combined G-MW and DPI budget was \$655,000 with \$650,000 being managed by Goulburn Murray Water (G-MW) and \$5,000 being managed by Department of Primary Industries (DPI) Catchment and Agricultural Services (CAS).

Other aspects of the GSMP were under expended in 2008/09 and an increase of funding was made available to the R&I Strategic Plan in the latter part of the 2008/09 financial year. It was deemed appropriate to progress high priority projects brought into the R&I Strategic Plan after the mid-term review.

Total expenditure for the financial year was \$877,912 (G-MW: \$838,912, DPI: \$44,000). Detail of budget and expenditure is shown in **Attachment F**.

Funding Acknowledgements

This program is delivered through partnerships between G-MW, DPI and the Goulburn Broken Catchment Management Authority (GB CMA).

The GSMP is funded as part of the Shepparton Irrigation Region Catchment Implementation Strategy (SIRCIS) with support and funding from the Victorian Government through State Salinity Infrastructure funds.

Conclusion

The GSMP R&I Strategic Plan:

- was well managed and the 2008/09 financial year to meet its budget allocation and its key project outputs
- should continue to be monitored and adapted to its changing circumstances and operating environment whilst ensuring that expenditure is managed such that it is focussed on high priority projects that mitigate the impact of salinisation.

The GSMP will continue to:

- i. embrace a long-term, integrated, forward looking, strategic planning process that is innovative and is based on sound science
- ii. improve community awareness of salt management issues and strategies at a community level by promoting sustainable groundwater and salt management in the region.

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Attachments

Attachment A – GSMP R&I Strategic Plan Projects Completed in 2008/09 – Project Management and References

Attachment B - GSMP R&I Strategic Plan Entire Projects Completed in 2008/09 – Project Outcomes

Attachment C - Summary of new issues identified and project outlines developed in the 2008/09 financial year

Attachment D - GSMP R&I Projects merged with other GSMP R&I Projects

Attachment E - GSMP R&I Strategic Plan Projects on hold

Attachment F- 2008/00 GSMP R&I Strategic Plan expenditure for each sub-section

ATTACHMENT A

Attachment A - GSMP R&I Strategic Plan Projects Completed in 2008/09 – Project Management and References

Project No.	Project Title	Date Completed	Agency Responsible for Implementation	Project Manager	G-MW DOCS File Reference	Output Description	G-MW DOCS Number Reference
GG06 007	Review of Potential Impact of Projected Changes in Groundwater Levels and Salinity	January 2009	G-MW	Terry Hunter	2005/588/1	Implications Paper SKM Report A statistical technique	2491840 2589227 N/A
GG07 041	Procedures Manual for Salt Administration and Reporting for the GB CMA	June 2009	G-MW	Peter Dickinson		Implications Paper Procedures Manual	

ATTACHMENT B

Attachment B - GSMP R&I Strategic Plan Entire Projects Completed in 2008/09 – Project Outcomes

Project No.	Project Title	Project Outcomes
GG06 007	Review of Potential Impact of Projected Changes in Groundwater Levels and Salinity	<p>Confirmation that the original predictions for areas to have high groundwater levels by 2020 in the Do Nothing scenario were reasonable based on groundwater behaviour trends;</p> <p>Identified that climate is a major driver of groundwater behaviour;</p> <p>Identified that using trend analysis to predict future groundwater behaviour is of limited value when major changes to drivers occur;</p> <p>Identified that there is a relationship between residual rainfall and the area with high groundwater levels;</p> <p>Identification that predicted residual rainfall sequences indicate that high groundwater levels are likely to occur during some periods in the future; and</p> <p>Confirmation of the need to undertake a total water balance assessment for the SIR including assessment of impacts of various climate scenarios.</p>
GG07 041	Procedures Manual for Salt Administration and Reporting for the GB CMA	<p>Development of a Procedures Manual for Salt Administration and Reporting in the GB CMA</p> <p>Development of Governance principles as well as roles and responsibilities for the collection, storage, transfer and reporting of data used to estimate salinity impact in the River Murray at Morgan on an annual basis.</p>

ATTACHMENT C

Attachment C- Summary of new issues identified and project outlines developed in the 2008/09 financial year

Issue No.	Issue/Project Title	Outcome
New I 08-1	Intensive agriculture and livestock operations and salt focus	Incorporate into Project GG09 002 <i>Investigation of salt mobilisation processes and impacts for various Climate Change Scenarios</i>
New I 08-2	Surface salinity impacts compared with groundwater induced salinity	Incorporate into Project GG09 002 <i>Investigation of salt mobilisation processes and impacts for various Climate Change Scenarios</i>
New I 08-3	Within irrigation season rainfall event based leaching versus winter rainfall and irrigation leaching	Incorporate into Project GG09 002 <i>Investigation of salt mobilisation processes and impacts for various Climate Change Scenarios</i>
New I 08-4	Differences in the salt management processes required under centre-pivot irrigation and sub-surface drip compared with border check irrigation	Incorporate into Project GG09 002 <i>Investigation of salt mobilisation processes and impacts for various Climate Change Scenarios</i>
New I 08-5	Recommended techniques for conjunctive use of groundwater with each of channel water, recycled sewage effluent and drainage water	Incorporate into Project GI02 021 <i>Report upon the financially viable and practical ways of using saline groundwater [Links to SBC (Undera, Tongala reuse and SBC – CSIRO)]</i>
New I 08-6	Need to have policy for discharge from small desalination plants	EPA policy issue – refer to the Water Services Committee (WSC)
New I 08-7	Investigation of salt mobilisation processes and impacts for various Climate Change Scenarios	Formed new Project GG09 002 – Project Outline developed, included in 2008/09 R&I Strategic Plan Program
New I 08-8	Development Policy and Management response based on outcomes of Investigation of salt mobilisation processes and impacts for various Climate Change Scenarios	Formed new Project GG09 003 – Project Outline developed
New I 08-9	Development strategy for provision of extension advice shallow irrigation bore owners	Scored as a project in Mid-term review – low priority - to be considered in program before 2011.
New I 08-10	Environmental Impacts of Public Pump Operation on environmental features through drainage discharge following modernisation	Scored as a project in Mid-term review – low priority - to be considered in program before 2011.
New I 08-11	Digitisation of FEDS EM survey and Pump testing data into GIS format.	Scored as a project in Mid-term review – low priority - to be considered in program before 2011.
New I 08-12	Investigate opportunities to implement risk based irrigation development boundaries near environmental assets	Scored as a project in Mid-term review – low priority - to be considered in program before 2011.
New I 08-13	Develop a strategic approach to meeting key environmental feature objectives of the SIR GSMP	Formed new Project GG09 001 - Project Outline developed and the project is included in the 2008/09 R&I Strategic Plan Program
New I 09-1	Management of East Shepparton Community Groundwater Pumps	Will be prioritised as part of the 2009/10 annual review of new issues and projects to be incorporated into the GSMP R&I Strategic Plan

ATTACHMENT D

Attachment D - GSMP R&I Projects merged with other GSMP R&I Projects

Project No.	Project Title	Project Objectives	Project Merged with
GG05 032P	Groundwater pump operating rules, pumping rates and design criteria	<ol style="list-style-type: none"> 1. Use an economic basis to determine the optimal pump operating/pumping rates and rules (including hibernation) to achieve the best outcome for the region considering variations in crop type, seasonal needs, soil type, groundwater salinity, groundwater levels, salt disposal and the means of groundwater and salt disposal 2. Compare the new pumping rates/needs identified as part of the project with the "current rules of thumb" 3. Review the design criteria and guidelines for public and private pumps and recommend economically justified hardware and software changes 4. Determine the reliability of the public and private pumps and determine any adverse impact material specifications or design deficiencies may be having on this performance and recommend any changes 5. Compare the Salt Audit Model (Project GG03 048) assumptions with the current operating rules. 	GG06 031
GG04 049	Watertable Behaviour Analysis	<ol style="list-style-type: none"> 1. Analyse watertable behaviours in the Dhurringile Area 2. Identify what are the main causes of the watertable behaviour documented 3. Assess the implications of the results to the rest of the SIR 	GG08 010
GI07 011	Develop a Climate Change Scenario as a management tool	<ol style="list-style-type: none"> 1. Determine the long range climate change scenario and cyclic weather pattern, for use SSDP planning in the SIR 2. Using the long range climate change scenario and cyclic weather pattern, identify the key factors in that will affect the sustainability of the SSDP 3. Determine the sub-surface drainage requirement for the most likely climate change scenario. 	GG08 010
GG07 013	Changing Management Needs SSDP in view of land use and climate change	<ol style="list-style-type: none"> 1. Use the outputs of the scenario analyses and the climate predictions, undertaken in Project GI0 7012 Develop a Climate Change Scenario as a management tool and GG070 13 Future Scenarios for TWE, Water allocations, land use, G-MW administrative changes and TCC, to determine likely SSDP management needs in response to changing conditions 2. Where appropriate propose management actions in response to changing requirements. 	GG08 010

Project No.	Project Title	Project Objectives	Project Merged with
GG07 040	Report on annual groundwater usage relative to allocation and estimated sustainable yield and any associated water quality change	<ol style="list-style-type: none"> 1. Review and report on annual groundwater usage relative to entitlement and groundwater levels 2. Review the sustainable resource allocation and the veracity of the results 3. Report on annual groundwater usage relative to the adopted sustainable resource availability 4. Report on annual groundwater quality and any usage related water quality changes together with the possible cause of the changes. 	GG08 010
GG08 004	Identify the reasons why there are areas with water tables less than 1m on the August 2007 groundwater contour maps	<ol style="list-style-type: none"> 1. Identify the key factors that may be responsible for water tables being recorded as less than 1m in the SIR in 2006/07 in specific areas 2. Determine the implications of water tables being recorded as less than 1m from the surface in 2006/07 in each area for the SSDP and the SIRCIS. 	GG08 010
GG07 014	Impacts of likely changes to groundwater use (climatic variability)	<ol style="list-style-type: none"> 1. Determine the impact of the weather pattern changes on water use in the SIR 2. Report on the impact that these changes are likely to have on the SSDP 3. Develop strategies to ensure SSDP water extraction needs are met when these weather pattern changes occur. 	GG08 010 and GG07 013
GI04 038P	Risk Assessment of Saline Discharge to High Value Environmental Features	<ol style="list-style-type: none"> 1. Assess the impact of salt discharged to wetlands and streams used as part of the internal SIR salt conveyance plan 2. Review the current acceptable levels of salt concentration for the discharge of groundwater and any other surplus water to wetlands and streams and other High Value Environmental features. 	GG09 001
GI04 037P	Review of SSDP cost shares - environmental aspects	<ol style="list-style-type: none"> 1. Review and report on the capital and operating cost shares which have been used for the protection of environmental features (including grasslands) outside the SIR 2. Recommend how the capital and operating costs of protecting environmental features should be shared between key stakeholders 3. Recommend how the cost of upgrading pump standard of service (capital and operation costs) and reliability should be shared (including Phase A arrangements) to protect environmental features? 	GG09 001
GI04 039P	Protection of High Value Environmental Features	<ol style="list-style-type: none"> 1. Develop guidelines to protect and where possible enhance the health of environmental features affected by groundwater 2. Develop tools and measures which could be used to protect wetlands and other environmental features from groundwater impacts 3. Develop management plans to enhance the identified environmental features and design concept works for their protection and or enhancement. 	GG09 001

Project No.	Project Title	Project Objectives	Project Merged with
GG07 042	Review GB CMA Salt Disposal Impacts and Needs	<ol style="list-style-type: none"> 1. Review the current salt disposal needs and its impacts 2. Determine future salt disposal needs for the GB CMA 3. Broadly identify how the salt disposal needs will be offset 4. Determine the expected increase in cost to each of the stakeholders 5. Consider the implications on GB CMA 5-Year Reviews and interaction with other projects. 	GG09 002
GG08 005	Review of Salt Management Data Recording and Storage Facilities	<ol style="list-style-type: none"> 1. Review of data monitoring and storage facilities used by the Goulburn Broken Catchment Management Authority and Goulburn-Murray Water to support salt administration and reporting 2. Identify all purposes of the database and provide recommendations for improving the integrity and reliability of these databases. 	GG09 002
GG05 032P	Groundwater pump operating rules, pumping rates and design criteria	<ol style="list-style-type: none"> 1. Use an economic basis to determine the optimal pump operating/pumping rates and rules (including hibernation) to achieve the best outcome for the region considering variations in crop type, seasonal needs, soil type, groundwater salinity, groundwater levels, salt disposal and the means of groundwater and salt disposal 2. Compare the new pumping rates/needs identified as part of the project with the “current rules of thumb” 3. Review the design criteria and guidelines for public and private pumps and recommend economically justified hardware and software changes 4. Determine the reliability of the public and private pumps and determine any adverse impact material specifications or design deficiencies may be having on this performance and recommend any changes 5. Compare the Salt Audit Model (Project GG03 048) assumptions with the current operating rules 	GG06 031

ATTACHMENT E

Attachment E - GSMP R&I Strategic Plan Projects on hold

Project No.	Project Title	Project Objectives
GG07 017	Impacts of Reconfiguration and Water Trade on SSDP Assets	<ol style="list-style-type: none"> 1. Determine the potential impact of G-MW water supply system reconfiguration on SSDP supported assets 2. Determine the likely impact of reconfiguration on public and private SSDP assets 3. Document the potential short and long term impact of water trading on SSDP assets and SSDP management arrangements.
GG07 033	Accounting for potential MDBC Policy Changes	<ol style="list-style-type: none"> 1. Determine implications of the base data changes for the modelling behind the 800 EC Morgan mean salinity target 2. Advise on the scale of the impact that this will have in the SSDP.
GC04 005	Review of SSDP cost shares	<ol style="list-style-type: none"> 1. Review and report on the current cost sharing arrangements against the principles agreed in the Plan 2. Report on whether the current cost share formulae are equitable (including Phase A).
GG02 028	Develop options to maximise salt credits to the region	<ol style="list-style-type: none"> 1. To determine future salt credit needs of the SSDP and the SIRLWSMP 2. Report upon the options for managing salt within the region including storage within the soil profile, evaporation basins, etc. 3. To secure sufficient salt credits to achieve the objectives of the SSDP and SIRLWSMP 4. To identify opportunities to secure additional salt credits through the implementation of local works and measures (salt inflows and salt interception) 5. To develop a business case to maximise the uptake of any further salt credit allocations from the State Government.
GI06 055	Mt Scobie Partial Conjunctive Re-use Study	<ol style="list-style-type: none"> 1. Gain additional funding for the Mt Scobie partial conjunctive re-use study through the SSDP R&I Strategic Plan process to enhance the analysis of the site, which is approaching ten years of operation.
GG07 007	Strategy to ensure adequate installation of Private SSDP Assets	<ol style="list-style-type: none"> 1. Develop a strategy to ensure that private adoption rates match those required to achieve SSDP targets 2. Develop a strategy to ensure long term high use of SSDP assisted initiatives.
GG06 031	Assessment of groundwater pump performance	<ol style="list-style-type: none"> 1. Review the current protocols for determining where SIRLWMP groundwater control and/or salinity control options may be appropriate in the SIR 2. Review the operation of public and private pumps and report upon whether the most cost effective pumping regime is being used considering the salt disposal needs and the variations in groundwater levels and salinity 3. Develop better techniques for predicting long-term changes in salinity for pumps located and tested in the FEDS program 4. Develop and trial a preferred rapid appraisal technique for determining the effectiveness of public and private groundwater pumping systems and other SSDP works and measures (there may be more than one model).

ATTACHMENT F

Attachment F - 2008/09 GSMP R&I Strategic Plan expenditure for each sub-section

GSMP R&I Strategic Plan Sub-Section	Expenditure (\$)	Proportion (%)
G-MW Expenditure		
Management and Administrative Support	221,010	25.1%
Grouped Salt Projects	349,281	39.8%
Groundwater Management	186,675	21.3%
Communication of Integrated Delivery	0	-
Grouped Environment Projects	76,946	8.8%
DPI Expenditure		
DPI R&I Strategic Plan Projects	44,000	5.0%
Total	877,912	100%

Due to changes in R&I Project Grouping in Mid-term review it is not possible to present an itemised change in expenditure from 2007/08 to 2008/09, however the increased emphasis on the environment saw an increase in Environmental Management by over 2,000% from \$3,769 to \$76,946.

The initial combined G-MW and DPI planning budget assigned for the R&I within the GSMP for 2007/08 in July 2008 was approximately \$836,000. This figure was revised in August 2008 (\$716,000), primarily due to \$100,000 being moved to the GSMP Implementation sub-program for investigation of high value environmental features at Millewa Conservation Reserve and revised again in January 2009 (\$655,000) due to the exclusion of DPI Project *GI06 054 Impact of Water Trade on Agricultural Ecosystems*, which was funded in full by DSE, Sustainable Irrigation Program. This total planning budget included the implementation and management of the GSMP R&I Strategic Plan, and other R&I related tasks that are conducted by G-MW and DPI for the GSMP.

The total preliminary expenditure for the GSMP R&I Strategic Plan in 2008/09, as recorded by G-MW and DPI was approximately \$877,912 This includes expenditure for individual GSMP R&I Projects (including project management costs) within the Strategic Plan and the overall management of the GSMP R&I Strategic Plan. Total expenditure of \$877,912 indicated 5% over expenditure relative to the original budget, 34% over expenditure relative to the revised budgeted amount (January 2009) and 87.4% more than in the 2007/08 financial year (\$468,366). Expenditure for 2008/09 GSMP R&I Strategic Plan is deemed to be within acceptable limits.
