

Shepparton Irrigation Region Drainage Program Review Summary

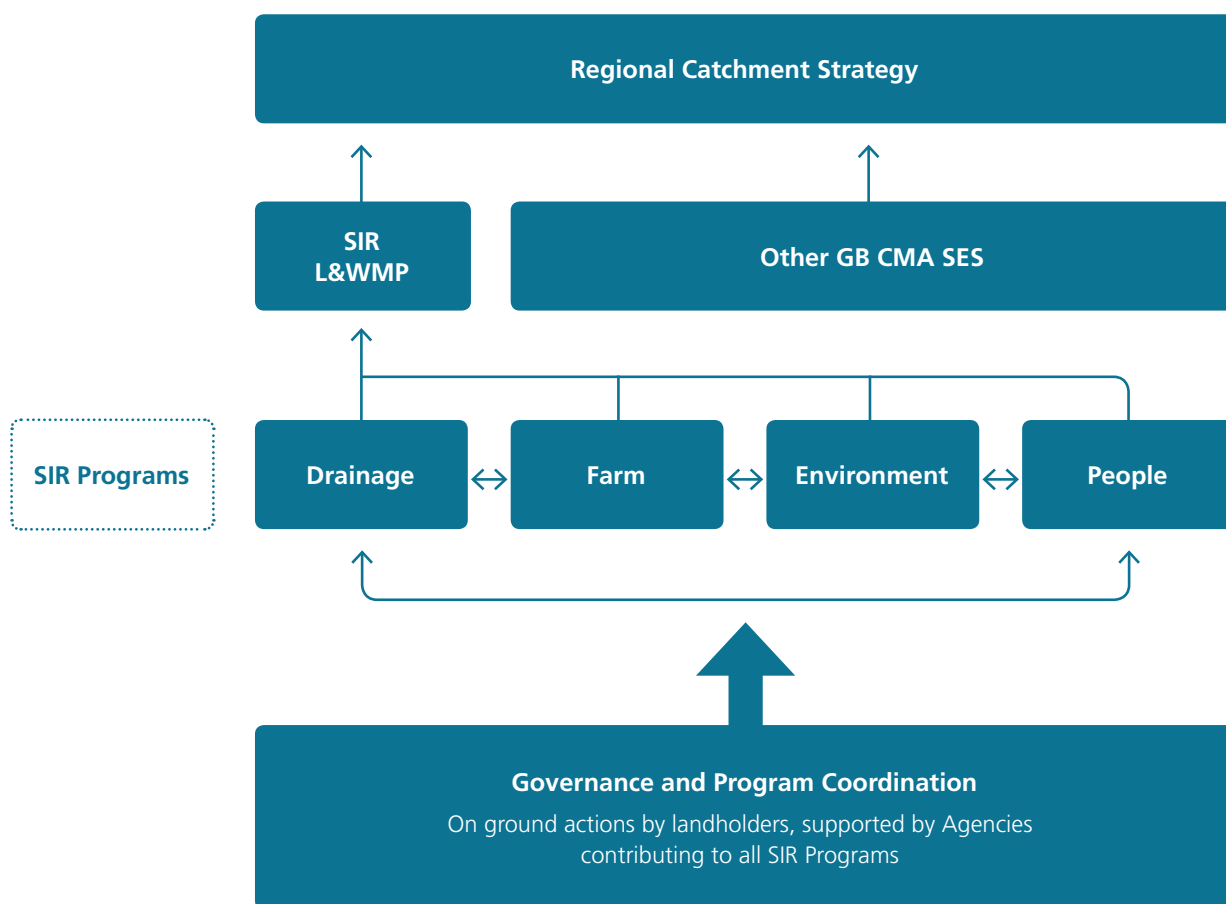


The Shepparton Irrigation Region (SIR) Drainage Program is one of four components of the SIR Land and Water Management Plan (LWMP) designed to implement a package of works across the region to support and grow the natural resource base to ensure agriculture, biodiversity and people flourish. The SIRLWMP is, in turn, a key part of the Goulburn Broken Regional Catchment Strategy.

The goal of the Drainage Program is to work with community *to provide innovative groundwater and salt management services which support sustainable agricultural practices and protect environmental assets across targeted areas of the SIR.*

This Drainage Program Review is the most recent of a series of reviews that have been conducted over the 25 year life of the Program to evaluate its success and set directions that are relevant to the needs of the region.

Relationship between programs and Regional Catchment Strategy



Note: SES stands for socio-ecological systems in the RCS, of which Agricultural Floodplains SES encompasses the Shepparton Irrigation Region (SIR) Land and Water Management Plan.

What has been done in the Review

A high level, scoping review of the SIR Drainage Program has been carried out. The review has documented a strategy/program of indicative works to provide appropriate drainage infrastructure and works. The Drainage Program includes both surface and sub-surface drainage. The Surface and Sub-surface Drainage Programs have been reviewed separately in the past and this is the first time they have been considered as a single package.

The review project has been undertaken by consultant Charles Thompson of RMCG, overseen by Steering and Project Management Committees made up of agency and community members.

The review considered the Drainage Program in the context of (among other things):

- Regional Catchment Strategy (RCS) planning
- the review of the Shepparton Irrigation Region Land and Water Management Plan
- Victorian Government Irrigation Program priorities 2013-2018
- the review of the Victorian Irrigation Drainage Program
- Murray Darling Basin Salinity Management Strategy and Basin Plans
- the Irrigation Drainage Memorandum of Understanding (IDMOU)
- Irrigation modernisation
- changed understanding of the catchment salt and water balance
- the Goulburn Murray Water (GMW) Drainage Tariff Review
- the Goulburn Broken Catchment Management Authority (GBCMA) Whole Farm Planning Review.

The review was done in three phases; Phase A – Review of current situation and need; Phase B – Strategy development; and Phase C – Works prioritisation, consultation and integration. Detailed reports have been written for each phase and are available upon request from the GBCMA. This document provides a brief summary of these phase reports.

Key messages from the Review

The original assumptions justifying the need for regional drainage need updating due to changes in water availability, water trading, land use, irrigation modernisation, the shrinking irrigation footprint (300,000 ha to 120,000 – 200,000ha) and on farm reuse of irrigation water. Conditions have changed from the original 1989 “underground flood” period to the post-2003 “dry period”. Accounting for water trade, climate change and variability and a declining footprint from the Basin Plan is vital.

The emphasis has moved from the management of low flow irrigation runoff to the management of runoff from “big rainfall events”. The cost of summer storm events for intensive irrigation is high and climate change predictions are for an increasing number and intensity of these types of events.

An area of 103,000 ha of the SIR is now estimated to still require drainage (this is substantially less than the previous estimate of 229,000 ha) (see map over page). The question is how to most effectively manage drainage in this area.

Farm reuse of collected runoff will continue to be an integral part of the Drainage Strategy and irrigation and rainfall runoff is collected and reused before entering any community or GMW drains on many SIR farms, even when they are in place. There is also recognition that an understanding of drainage/flooding risk underpins landholder plans with regard to where to irrigate and selection of crop types.

The cost of the traditional primary drain and community drainage system has been determined to no longer be economically viable across the remaining area requiring drainage and there is a clear need to address the changed economics by developing a new type of lower cost drainage system.

While the main justification for a new type of drain is that the cost of the traditional drains is no longer economically viable, primary drains are already in place and the main body of work now is to use “hybrid drains” to connect the remaining “economic to drain” areas to the natural drainage system.

Economic analysis of costs and benefits of providing drainage using the hybrid system shows:

- large differences between undrained sub-catchments
- from an economic viewpoint the Benefit Cost Ratio improves from 1.01 to 1.3 if only economic sub-catchments are selected
- the area requiring drainage falls from 103,000 ha to 64,000 ha if economic sub-catchments only are selected

- a key reason for sub-catchments not being economic is a higher present value of costs per hectare associated with a high amount of constructed drainage, which is expensive
- calculated benefits (Present Value of Benefits - PVB) include costed environmental benefits based on the length of natural waterways and area of wetlands; agricultural benefits based on the reduction in flooding, waterlogging and salinity costs by land use in each catchment; and road benefits based on a reduction in maintenance costs for the length of roads in each sub-catchment.
- the calculation ignores the social benefits, which will vary from sub-catchment to sub-catchment.
- with a few exceptions (eg. Lockington) there is little variability in the PVB per hectare. Most of the benefits are associated with roads (46%) and the environment (30%), while agricultural benefits are relatively low.

Drainage investment in economic sub-catchments is estimated at \$32.5 million in capital works and \$138,000/year in operation and maintenance costs. This estimate is significantly less than previous costings based on calculations of constructed drains across a greater area.

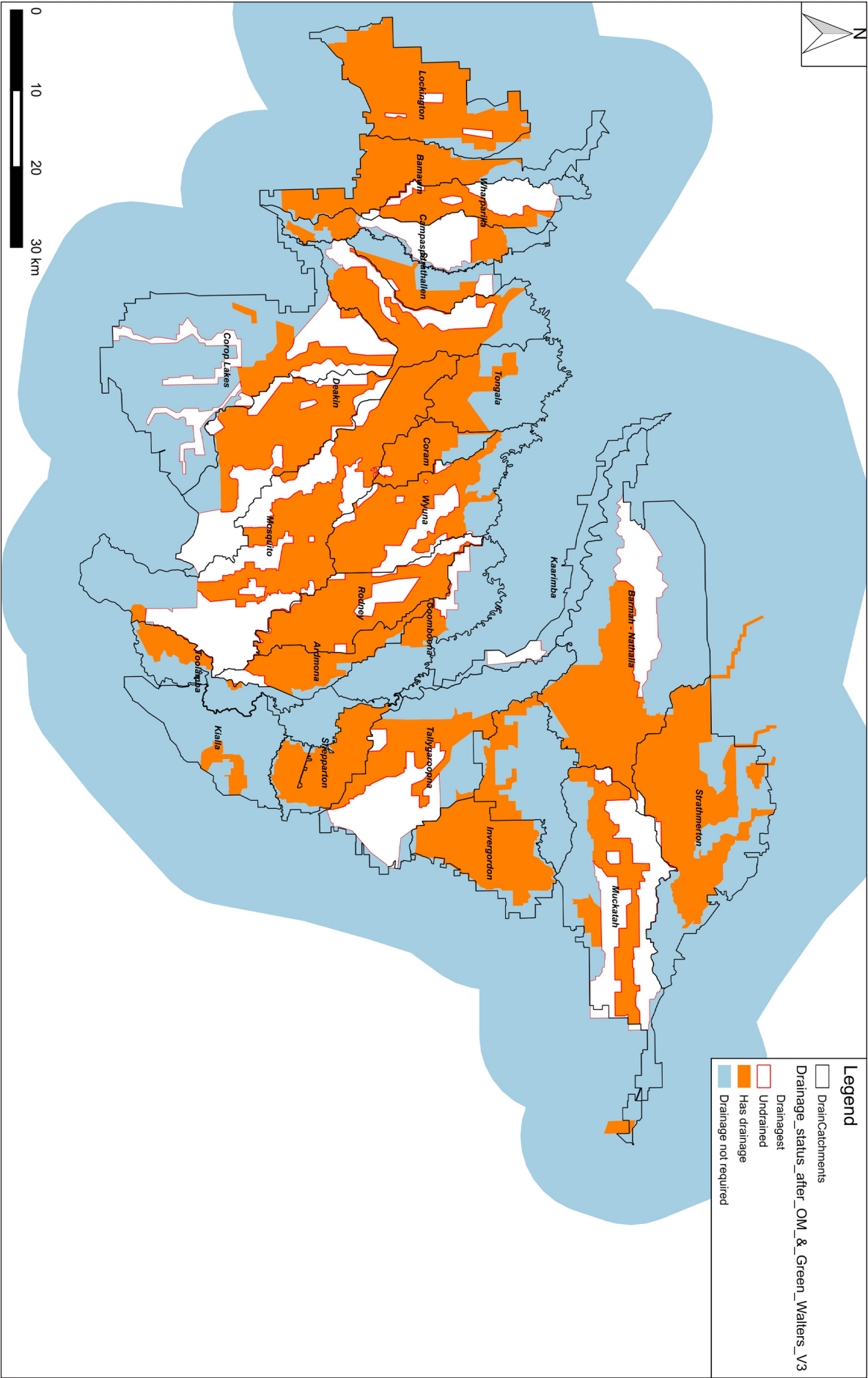
Review directions

The review provided the following directions:

- Endorsement of an adaptive management approach for subsurface drainage. This involves monitoring until groundwater tables reach threshold levels that pose risks to the region and then taking appropriate action.
- Implementation of a new type of lower cost surface drainage system; a "hybrid drain", comprising of drainage course declarations (DCD) and constructed drains, where constructed drains are similar to community surface drainage (CSD) systems.
- Economical surface drainage works be prioritised using the new "hybrid drain" system with "hybrid drains" developed on the concept of maximising the ability of natural drainage lines to carry away surface water by removing artificial blockages to active flow paths. An important part of the Drainage Strategy is to provide on-going protection of these flow paths using legislation with DCD that prevent artificial blockages occurring on these lines. The "hybrid drain" concept recognises that natural drainage lines are not always sufficiently defined and will need to be supplemented by constructed surface drainage in some locations.
- The approach to design of "hybrid drains" considers environmental requirements, outfall capacity and land use, rather than be based on standard criteria. Designs will be influenced by changed ratios of irrigated to non-irrigated land use.
- A prioritisation process developed for remaining "economic to drain" areas, considering social, environmental and economic impacts to be implemented to provide guidance for staging of works (subject to funding).
- Where there are areas that are not economic to drain, options for landholders to manage the risks themselves be provided which could include:
 - pumping to GMW channels (where the risks are acceptable and operating rules are in place), although this may be undesirable in the long term
 - the use of decommissioned channels to remove water to an outfall
 - building larger reuse storages than currently allowed - seen as an important part of the solution to alleviate drainage problems on farm
 - equipping landholders with a better understanding of flooding risks on farm, so that they can minimise their losses on areas that are prone to flooding and waterlogging losses.
- On-going monitoring and evaluation covering farm, surface and sub surface drainage be an essential part of the package.

A program of activities and works is outlined, aligned to key stakeholders. Implementation of the Drainage Program will be subject to funding availability.

Location of undrained land (shown in white), not required to be drained (blue) and already drained (orange) by catchment



Future actions

Stakeholder	Actions to support the implementation of the drainage program (funding sources will be different)
Landholders	• Implement farm actions to mitigate drainage risks. • Participate in coordinated “hybrid” drainage schemes. • Contribute to cost share of drainage via new GMW tariff.
GMW	• Design and implement hybrid drains in priority areas including constructing “hybrid” drainage works/ drainage course declarations. • Provide support to investigations on sub-catchment areas in Deakin and Muckatah or other areas where landholders have indicated that they are prepared to self-fund surface drainage works. • Develop operating rules. • Maintain drainage systems. • Ensure tariff and rating arrangements are in place (especially for DCD). • Undertake risk assessment of channel pumping and depending on outcomes develop a channel pumping strategy with operating rules. • Maintain knowledge base on surface and subsurface drainage risks and also groundwater management. • Maintain drainage flow and water quality monitoring network. • Maintain groundwater monitoring, reporting to ensure adaptive approach can be implemented and that up to date extension on watertable risks can be maintained.
GBCMA	• Provide environmental input into drainage design. • Oversee farm extension programs, including whole farm planning, to assist landholders manage drainage risks, including larger scale reuse. • Assess impact of larger reuse storages on compliance with MDB cap (in partnership with GMW/DELWP/DEDJTR). • Coordinate and integrate drainage program within broader Regional Catchment Strategy. Including investigations on sub-catchment areas in Deakin and Muckatah or other areas where landholders have indicated that they are prepared to self-fund surface drainage work. • Flooding mapping and risks.
Local Government	• Contribute to the operations and maintenance costs of the Salinity Public Asset Control Works (NB As per existing cost sharing agreement (17% contribution)). • Contribute to drainage costs and the construction of road crossings built as part of the drainage systems according to the benefit to Local Government and on case by case basis).
Vic Roads	• Contribute to drainage system costs and the construction of road crossings built as part of the drainage systems (according to the benefit to roads and on a case by case basis).
Aboriginal groups	• Provide cultural heritage assessments and management plans for drainage.
Department of Environment, Land, Water and Planning (DELWP)	• Provide investment and support for implementation of the drainage strategy (extension and works). • Alignment with state strategies and programs. • Assess public benefits, particularly environmental benefit. • Progress the development of an “umpire” and responsible agency for resolving drainage issues. • Coordinate IDMOU. • Ensuring drainage complies with Victorian Water Resource Plans under the Murray Darling Basin Plan.
Department of Economic Development, Jobs, Transport and Resources (DEDJTR)	• Provide extension services to the drainage program related to farm risk mitigation and environmental management. Provide monitoring and evaluation services. • Provide monitoring and research services. Including tracking areas of irrigation, areas served by reuse systems, irrigation intensity and demand for drainage in undrained areas. This should be GIS based.
Environmental Protection Authority (EPA)	• Continue to participate with IDMOU and manage point source discharges to drains.
IDMOU partnership (GMW, EPA, DELWP, DEDJTR, CMAs)	• Water quality monitoring, evaluation and reporting through GMW and other agency programs. • Water quality impacts and risk assessment.
VFF, Industry and farmer groups	• Provide advice on drainage needs and solutions. • Technical inputs and research services.
Environmental non-government organisations	• Provide advice on environmental issues related to drainage.
Australian Government	• Potential investor for areas of national environmental benefit, referral for any EPBC requirements. • MDBA – salinity accounting in the Basin Salinity Management Strategy, plus compliance with the MDB cap on diversions. Also meeting water quality obligations of the Basin Plan.