



# **GAWLER RIVER STORMWATER MANAGEMENT PLAN SUMMARY**

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# Acknowledgement of Country

The Gawler River Floodplain Management Authority would like to acknowledge the Traditional Owners of the land on which we live and work, and pay our respects to their Elders past, present and emerging.

## Introduction to the Gawler River Stormwater Management Plan Summary

### What is stormwater management?

When we talk about stormwater, we are talking about rain that can't be soaked up by the ground, so it gets carried away by drains and pipes or flows across the land to natural waterways.

It is important that we manage stormwater as it can help to reduce the risks to homes and businesses from flood damage. It can also provide opportunities for using the stormwater and for improving water quality by filtering out pollutants picked up from roads, lawns and other urban and agricultural areas.

There are a range of ways to manage stormwater, including natural solutions such as wetlands and rain gardens or by ensuring the planning codes which govern new developments consider the opportunities and risks of stormwater management.

### What is a stormwater management plan?

A stormwater management plan (or SMP) is a planning document which looks at how much rainfall occurs in a given area and where it tends to fall. It then uses this information to recommend opportunities for improving stormwater management across the area.

An SMP is usually commissioned by the Council responsible for the area involved. However, as the river flows through six Council areas, this SMP has been commissioned by the Gawler River Floodplain Management Authority (GRFMA) who represent the six Councils – Adelaide Plains, Adelaide Hills, Barossa, City of Playford, Light Regional and Town of Gawler. Although the Councils will provide input into planning, any projects undertaken as a result of this SMP will be the responsibility of the GRFMA and not the individual Councils.

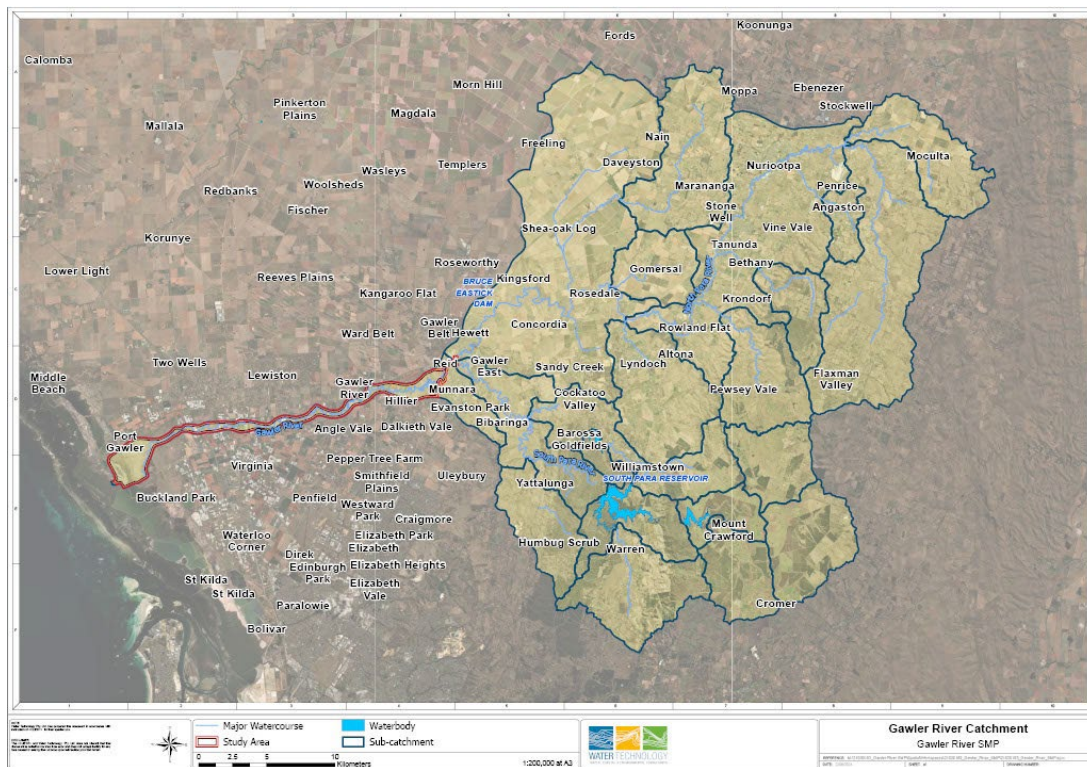
The SMP does not give a green light to any of the projects outlined or provide a way to fund the work. It also does not look at small, localised issues such as water pooling on a road, rather it looks at the impacts and opportunities of large rain events where there is the chance of significant damage or benefits.

This SMP has been developed in partnership with the Stormwater Management Authority and the GRFMA thanks them for their support.

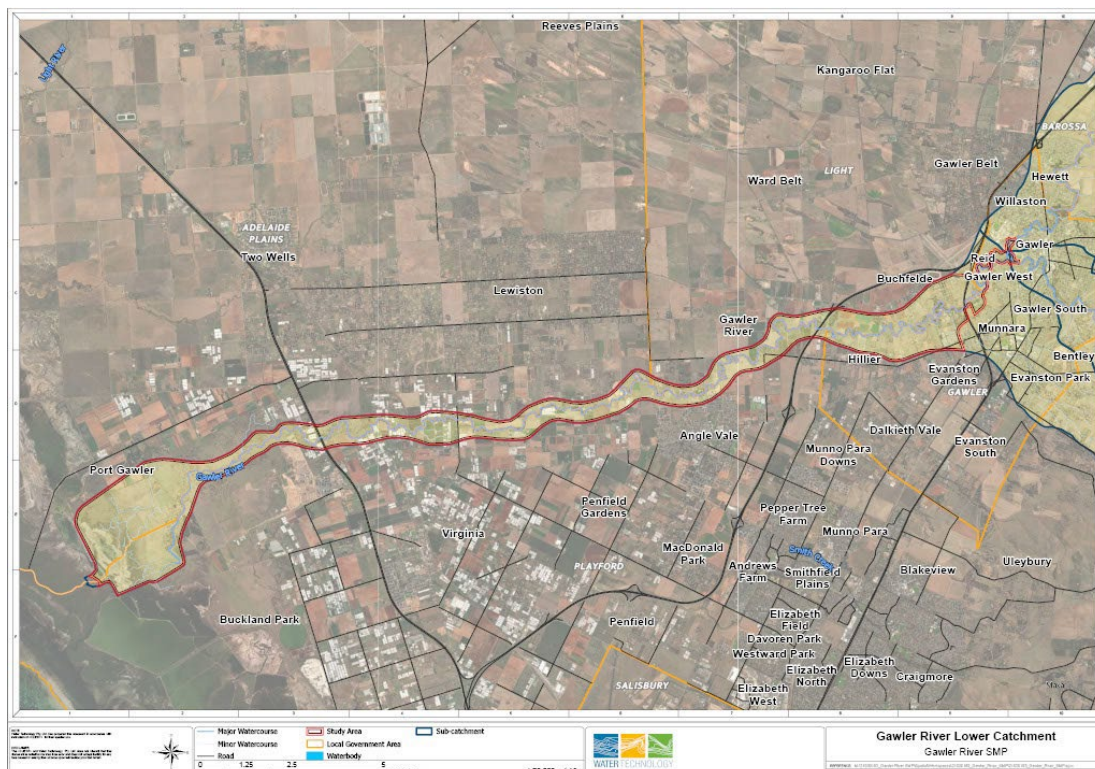


## What is in the Gawler River SMP?

Water flows down from the hills and valleys of the Barossa and Adelaide Hills into the South and North Para Rivers and these meet north of Gawler township to become the Gawler River. This is known as the Gawler River catchment and the map below shows the areas covered by this catchment.



The Gawler River SMP covers the stretch of river from Gawler township to where it meets the Gulf of St Vincent at Port Gawler and the areas immediately around the river channel – shown in red in the map below.



Water Technology, an environmental consulting company, identified how water flows into and along the Gawler River, what lives in and around the water and what cultural heritage and infrastructure considerations there are for managing the flow of water.

All of this information has been used to inform a set of stormwater management objectives for this SMP and also identify a list of potential works which should be considered in order to meet those objectives.

This summary highlights key areas within the full SMP which we are asking the community to provide feedback on during this consultation process. Any feedback will be considered by the GRFMA prior to final approval of the SMP.

## **What are we asking the community to do?**

Once you have read the SMP and/or this summary document, we would like to know whether you agree with the proposed projects and their recommended order of priority. If not, what do you think has been missed or not considered fully?

You can provide your feedback in a number of ways:

### **Online**

City of Playford Council has kindly agreed to support this consultation by hosting an online survey in their Engagement Hub at [www.playford.engagementhub.com.au](http://www.playford.engagementhub.com.au). The survey will be available from Monday 14 April until Sunday 11 May 2025.

### **In person**

GRFMA are hosting two drop-in sessions where members of the community can talk to members of the GRFMA or Water Technology team:

- Tuesday 29 April – Gawler Civic Centre’s Institute Hall between 3pm and 6pm
- Thursday 1 May – Angle Vale Community Sports Centre between 3pm and 6pm

### **E-mail**

You can provide feedback via e-mail to [emma@emmapink.com.au](mailto:emma@emmapink.com.au)

### **Phone**

Questions and comments can be provided by phone to Emma on 0421 011457

# Key sections of the SMP

## Section 1 - Introduction (pages 8 to 15)

This section introduces the SMP development process and an outline of other relevant policies, documents or projects which Water Technology considered during this process, including SMPs which have been developed for various townships and catchments in the area. It explains why the main focus of the Gawler River SMP has been on the impacts of water flowing down the river from the upper catchments.

## Section 2 - Catchment description (pages 16 to 39)

This section provides a description of the catchment, which is the area of land where rainwater collects and flows down into the Gawler River. It includes maps which show where the water flows under normal conditions, information on previous floods in the area and the impact these had and where infrastructure has been added to control flows. It also outlines what types of land use there are along the river and the importance of the river to the three First Nations communities.

## Section 3 - Problems and opportunities (pages 40 to 43)

This section describes some of the issues faced by the catchment including:

- How the various types of land ownership impact what work can be done in and around the river channel
- Instability of the banks due to increased land clearance for housing
- Threats to plants and animals in the area from loss of native vegetation and increases in pollutants
- Demand for water supplies
- A changing climate with hotter temperatures and more intense rainfall

The section then outlines the opportunities for improvement for each of the identified issues, including:

- Restoring areas of native vegetation and increasing the numbers of native fish and other species in the river
- Helping landowners understand the responsibilities which come with having levees on private land
- Encouraging land developers to consider natural (or nature based) solutions to stormwater management
- Using the Bruce Eastick North Para River Flood Mitigation Dam and South Para Reservoir as alternative water sources

## Section 4 - Stormwater management objectives (pages 44 to 47)

The objectives of these studies are primarily to provide evidence-based recommendations for:

- Flood mitigation measures including managing the existing flood and stormwater infrastructure
- Improving water quality in the catchment
- Maximising use of limited water supplies in the region
- Protecting and enhancing the environment in and around the river



Table 4.1 on page 47 summarises the measures that are recommended to evaluate the impact of the various objectives:

Table 4-1 Stormwater Management Objectives for the Gawler River SMP

Area	Objective	Measure
Flooding	Protect habitable buildings from inundation	1% AEP modelled protection for habitable floor levels with 300mm freeboard where this is practically and financially achievable
	Protect primary production land from inundation	5% AEP protection for primary production land with zero freeboard, where this is practically and financially achievable
	Minimise flood hazard to the community	Improved community awareness of flood risks and response procedures (measured through community surveys)
		All roads are trafficable for 1 in 5 ARI, depth no greater than 300mm in 1 in 100 ARI event (see flood hazard curves in Figure 4-1)
		No increase in peak flows as a result of development
Water quality	Improve the water quality of stormwater discharges to the receiving environments (Creeks, Rivers and Coast)	Planning controls effectively utilised to avoid development in high hazard areas
		Pollution reduction targets to be met for new developments: <ul style="list-style-type: none"> <li>- Total phosphorous 60%</li> <li>- Total nitrogen 45%</li> <li>- Suspended sediment 80%</li> <li>- Gross pollutants 90%</li> </ul>
Water Use	Increase the beneficial usage of stormwater	Volume of stormwater that is reused
		Number of passive irrigation systems that are implemented
		Number of new developments that encourage the installation of rainwater tanks
Environment Protection and Enhancement	Retain and enhance the habitat quality of the existing natural watercourses in the area	Length of waterway restoration works undertaken
		Measures in place to ensure that environmental water requirements of the receiving water bodies are able to be met and sustained
	Maximise the community use and benefit derived from stormwater management infrastructure, including opportunities for biodiversity, water quality, amenity and environmental enhancement	Number of stormwater management solutions implemented that provide broader environment protection and enhancement benefits
		Number of education and awareness sessions undertaken
Asset management	Clear identification of asset ownership and maintenance	Agreement in place on levee ownership and responsibility for maintenance
	Effective and sustainable long-term management of stormwater infrastructure, including asset renewal	Asset management strategies and plans in place

## Section 5 - Modelling (pages 48 to 73)

This section describes the investigations of the Gawler River area. Computer programs have been used to see what might happen with different amounts of rainfall and how that would change based on the actions proposed in the SMP. This is called “modelling”. The Gawler River area has been modelled many times over the years and this section captures the different types of modelling, the areas they have covered and the limitations of these models.

It also outlines what would happen if existing flood mitigation structures like the levees or Bruce Eastick Dam were to fail during a flood and what the various economic impacts might include. An assessment against these impacts has been done for the short-listed mitigation options which are outlined in Section 8 of the draft SMP and listed on page 7 of this summary.

## Section 6 - Management strategies (pages 74 to 81)

This section reviews what can be done to better manage stormwater in the Gawler River catchment. This includes non-structural strategies including:

- Amendments to the South Australian Planning and Design Code to incorporate the latest flood hazard information
- Increasing public awareness of flood risks so they are better able to make plans to reduce damage during a flood
- Improving flood forecasting warning systems to allow emergency services personnel to respond with preventative measures such as sandbags
- Improving recovery from flood events by improving knowledge of flood behaviour

- Monitoring water quality across the catchment to identify areas of risk and target areas which need improvement
- Increased maintenance of stormwater drainage systems and other flood mitigation structures

There are also structural recommendations to improve the risk of regional flooding as follows:

Table 6-1 Regional Flooding Related Structural Management Strategies

Strategy	Description
Channel Widening	Widening to keep water within the existing channel system whilst minimising the need for further raising of levees.
Detention downstream of Gawler township	30,000 ML storage to reduce peak flow to 160 m <sup>3</sup> /s near Hillier A retarding basin downstream of Gawler would be constructed by excavating a large area of the floodplain to provide additional floodplain storage. Given the very flat terrain, the area required to install an effective retarding basin would be substantial, potentially covering an area of around 10 km <sup>2</sup> .
Enlarge Bruce Eastick Dam	Raise dam wall height by 10 m.
Northern Floodway and Levee Improvements	A northern floodway from Old Port Wakefield Road to the Port Wakefield Highway and then extending further west of the Port Wakefield Highway.
Southern Floodway and Levee Improvements	A southern floodway formed by raising Angle Vale Road (along with some additional smaller unsealed roads) to form a flood levee to prevent flood waters pushing south of Angle Vale Road.
Channel Desilting with New Outlet	Removing accumulated silt from the bed of the river without undertaking major changes to the riverbanks.
Replacement of Existing Levees	Assess the existing levees and determine if they need to be repaired or replaced to deliver intended level of service for flood protection.
New Strategic Levees – Gawler	Height – typically up to 600 mm Length – 4.7 km
New Strategic Levees – Virginia	Height – typically up to 500 mm Length – 3.4 km, 2.6 km
Strategic Levees – Two Wells	Height – varies up to 2 m Length – 2.4 km

This section also outlines further actions which could be taken to improve local drainage, improve water quality and reuse stormwater more efficiently.

## Section 7 - Costs and funding opportunities (pages 82 to 83)

Section 7 doesn't include the costs themselves but outlines the funding opportunities available from local, state and federal government departments.

## Section 8 - Decision-making methodologies (pages 84 to 91)

A short-list of projects has been recommended which have been assessed as effective in reducing flood risks and perform well in other social, economic and environmental assessments including:

- Bruce Eastick Dam Raise
- Bruce Eastick Dam Raise and Water Security
- Northern Floodway
- Township Levees
- Flood Awareness Campaign
- Dam Raise and Northern Floodway
- Dam Raise and Planning Controls
- Dam Raise and Township Levees and Planning Controls
- Dam Raise and Flood Awareness Campaign and Planning Controls

Each of these projects has undergone what is known as a 'multi-criteria analysis' which looks at what the problem actually is, what the solution needs to achieve, what criteria are relevant for measuring the benefits of that solution and what the measurement will be for evaluating it.

## **Section 9 - Priorities, timeframes, responsibilities and risks (pages 92 to 100)**

The Stormwater Management Authority (SMA) is the stormwater planning and prioritisation body for South Australia and is responsible for approving all SMPs with a view to ensuring they provide an integrated and holistic approach to stormwater management. SMA guidelines recommend that the highest priorities are for works that reduce flood hazard and protect life and property. Based on the outcomes of the options assessment and on this principle from the SMA guidelines, the projects have been given a priority order but as the largest reduction in flood risk will happen through a combination of these projects, the recommended actions are as follows:

### **Upgrade of existing levees**

The existing levees are in poor condition and in need of an upgrade to ensure they offer protection during a flood. Ongoing maintenance is also required.

Responsibility: Gawler River Floodplain Management Authority

Timeframe: Ongoing

Estimated Cost: \$30,500,000 capital + \$152,000 per year ongoing

### **Expansion of Bruce Eastick Flood Mitigation Dam**

Raising of the Bruce Eastick Flood Mitigation Dam is the preferred flood mitigation option.

Responsibility: Gawler River Floodplain Management Authority

Timeframe: 3 – 7 years

Estimated Cost: \$195,000,000 capital + \$107,000 per year ongoing

### **Education and Awareness**

Opportunities exist for a public education programme that raises awareness of flood risk and provides information to individuals and businesses that guides their response to floods can reduce flood damages. The benefit is increased community confidence and resilience. The Department for Environment and Water (DEW) is the lead on the community flood awareness and preparedness campaign, with GRFMA an active partner assisting in development and delivery of program resources.

Responsibility: Department for Environment and Water

Timeframe: Ongoing

Estimated Cost: \$517,000 upfront + ongoing costs to be determined

### **Flood Warning System**

A flood warning system includes having appropriate water monitoring infrastructure and data, forecasting capabilities, understanding of flood impact, flood warning generation and communication. This option does not mitigate the flood, but it can reduce the flood impact as people are enabled to respond proactively. Successful reduction of flood damages using flood warnings is dependent on the communities' ability to act on warnings (i.e. awareness and response).



Responsibility: Department for Environment and Water

Timeframe: Ongoing

Estimated Cost: To be determined

### **Land Use Planning and Planning Controls**

Reducing the flood damage potential to new assets on the floodplain can be achieved by planning and building in a manner that considers stormwater and flood management. There is also the potential to prevent new assets causing increased flood impacts on existing properties. Land use and planning controls could address different requirements for different kinds of development (e.g. hospitals) and for critical infrastructure (e.g. power and telecommunications). Planning controls are managed by the Planning and Design Code with standardised policies across South Australia. Councils can request an amendment to the Code.

Responsibility: Department of Housing and Urban Development

Timeframe: Ongoing

Estimated Cost: \$0

It is important to note that some of these projects require significant funding and will need to be undertaken over a number of years to fit with other priorities. Whilst the SMP is owned by the GRFMA, many of the projects are the responsibility of other local and state government stakeholders.

## **Section 10 - Recommendations and further work (pages 101 to 102)**

The main findings and recommendations from the development of the Gawler River SMP are:

- Mitigate flood risk by repairing/reinstating the existing levees (and ensuring ongoing maintenance) and raising the height of the Bruce Eastick Flood Mitigation Dam
- Revisit and determine the most effective way forward regarding the complicated land ownership and responsibility arrangements along the length of the Gawler River including the channel itself and the associated levee banks
- Develop an ongoing community education and awareness program covering many topics including flooding, climate change, benefits of river systems and opportunities to be involved in the protection and enhancement of the local environment

## **Section 11 - References (pages 103 to 106)**

Section 11 outlines the SMPs and other documents which have been used to inform this SMP.

## **Abbreviations and glossary (pages 107 to 110)**

These sections provide explanations for the acronyms and technical terms used in the SMP.

## **Appendix A - Summary of stakeholder consultation (pages 112 to 136)**

To date, stakeholder consultation has been undertaken with a range of stakeholders including the relevant councils and First Nations, Department for Environment and Water and the two local Landscape Boards – Green Adelaide and Northern & Yorke. There have also been workshops where attendees were split by their key area of interest – flood protection, transport and

development, utilities, recreation and amenity and environmental and water quality. The feedback from these stakeholders has informed development of this SMP and is outlined in this appendix.

## **Appendix B - Risks to marine habitats in the Port Gawler region from stormwater flows (pages 137 to 176)**

The South Australian Research and Development Institute (SARDI) provided an in-depth report on the habitats and key species which live in the area where the Gawler River flows into Gulf St Vincent at Port Gawler. The full report is included as Appendix B and the summary and conclusion section is copied below for ease:

“Stormwater from the Gawler River SMP area discharges to GSV via a small delta at Port Gawler, at the northern end of Barker Inlet. The area in the immediate vicinity of the Gawler River outfall comprises mangroves with some saltmarsh in the intertidal to supratidal, and seagrass in the inter- to sub-tidal. Within 5 km of the outfall, there are extensive seagrass beds in the subtidal, with mangroves and saltmarsh in the intertidal regions. These habitats support a range of fauna, including important fisheries species, threatened shorebirds, and a population of bottlenose dolphins.

Nutrient, freshwater and sediment inputs from stormwater may favour mangrove growth at the expense of saltmarsh, which would also be at risk from establishment of introduced coastal plant species. Mangroves could be adversely impacted if stormwater nutrients promote excessive growth of opportunistic (e.g., *Ulva* spp.) or invasive (e.g., *Caulerpa* spp.) algae that could smother pneumatophores or negatively impact seedling recruitment on tidal flats. Nutrient inputs could adversely affect seagrass through promotion of epiphytic growth and may encourage the growth of introduced macroalgae or of toxic phytoplankton, while sediment may impact seagrass through light reduction due to turbidity. Species utilising the habitats of GSV in the vicinity of the Gawler River outfall could be directly impacted by a range of stormwater pollutants, including metals, PAHs and organic contaminants.”

## **Appendix C - Ecological inputs to the Gawler River Stormwater Management Plan (pages 177 to 191)**

Appendix C comprises a list of the threatened ecological species within the Gawler Floodplain (Peppermint Box Grassy Woodland and Iron-Grass Natural Temperate Grassland). It outlines the ecological threats within the Gawler River catchment, existing water quality, types of fish and their flow and habitat requirements, native and introduced plants and local waterbirds.

The recommendations included in this report are as follows:

- Improve fish migration by removal or modification (providing fish passage) of weirs and instream blockages (in Gawler and Yaldara – outside study area)
- Remove or control alien fish species
- Remove pest plants and replant with native plants along riparian corridor
- Reduce sediment run-off - ensure catchment vegetation cover is high, revegetate bare or unused ground
- Practice low tillage agriculture
- Provide environmental flows with flow to the sea over an extended period late autumn to spring at least once every three years but preferably each year

Appendix D outlines previous flood modelling done in this area.

Appendix E contains a range of maps which illustrate what would happen under different levels of rainfall across the various areas covered and based on the various management options outlined in this SMP. For example, this map shows which areas would have a reduced risk of flooding if the works were done to raise the Bruce Eastick Dam. The areas in pink could be at risk of flooding if no work is done but should remain dry if the dam is raised.

