Contents

Introduction

The Stormwater Management Authority (SMA) is established as a statutory corporation pursuant to Schedule 1A of the *Local Government Act 1999*. The SMA acts as a state-wide planning and prioritisation body for stormwater management and implements the *Agreement on stormwater management between the State of South Australia and the Local Government Association of South Australia* (the Stormwater Management Agreement).

The Stormwater Management Agreement promotes the management of stormwater in a way that delivers multiple benefits including flood protection, public amenity, healthy waterways and healthy coastal environments.

Using These Guidelines

Scope and Purpose of these Guidelines

The SMA is required by legislation to issue guidelines for the preparation of stormwater management plans (SMPs). These guidelines have therefore been prepared to assist entities who are preparing SMPs for approval by the SMA in accordance with Schedule 1A of the *Local Government Act 1999*.

These guidelines present requirements that must be satisfied to produce a complying SMP. The SMA is not obliged to approve an SMP that does not comply with these guidelines, or that has been prepared in a manner that does not accord with these guidelines.

A checklist provided at Appendix A summarises the requirements of these guidelines.

Terminology

Throughout these guidelines, unless a contrary intention is evident:

- **Catchment** means the area for which a SMP is being prepared, regardless of whether it is a whole hydrological catchment or not
- **Community** means a group of people, the members of which reside in a catchment
- **Community engagement** means any process or interaction used to encourage and facilitate communication with a community and their involvement in decisions and activities
- **Entity** means the incorporated body (or group of incorporated bodies) that commissions the development of a SMP
- **Stakeholder** means any individual or group of people that has an interest or investment in a matter
- **Stormwater Management Authority (SMA)** means the board of the Stormwater Management Authority, its staff, or agents acting on its behalf
- **Stormwater Management Plan (SMP)** means a plan for the management and mitigation of stormwater as a hazard, and for managing stormwater in an integrated water management context
- **Stormwater** means water that runs off land or structures on land as a result of rainfall. Stormwater can fill surface depressions, flow over the ground surface, or flow into and out of channels, underground conduits and watercourses. As stormwater moves through the landscape, it can collect material (pollutants) that become dissolved (soluble) or suspended (insoluble).
- **Stormwater system** means any part of a natural watercourse, open channel or underground conduit conveying or intending to convey stormwater or floodwaters whether by gravity or by pumping and includes associated infrastructure such as levees, high level overflow paths, wetlands, detention basins, dams and pumping stations and any other associated infrastructure which is intended to improve the quality of any stormwater or floodwaters conveyed or to utilise as a water resource such stormwater or floodwaters[1].

Stormwater Management Planning

Legislative and Policy Context

The Stormwater Management Agreement provides for the preparation of SMPs by local government authorities for catchments in metropolitan Adelaide and in regional cities and towns to identify, prioritise and address stormwater issues in a considered and coordinated manner. Schedule 1A of the *Local Government Act 1999* provides the SMA with powers to require the preparation of SMPs and to approve SMPs.

Schedule 1A requires that objectives for stormwater management are consistent with the Stormwater Management Agreement and include environmental objectives and sustainability objectives that are consistent with the *Environment Protection Act 1993* and the *Landscape South Australia Act 2019*. SMPs should therefore be consistent with the requirements of regional landscape plans and any water allocation plans in force.

It is also expected that SMPs are developed with regard for relevant state and national policies and plans (see Table 1), the Planning and Design Code, and the entity's own plans including their strategic plan(s), long-term financial plan(s), development plan(s) and asset management plan(s).

[1] *Agreement on stormwater management between the State of South Australia and the Local Government Association of South Australia*

Table 1: State and national policies and plans relevant to stormwater management planning.

State and National Policies and Plans	
• Adelaide Coastal Water Quality Improvement Plan • National Strategy for Disaster Resilience • National Water Quality Management Strategy • Prospering in a Changing Climate (state climate change adaption framework)	• State Landscape Strategy • The 30-Year Plan for Greater Adelaide • Water Sensitive Urban Design: Creating more liveable and water sensitive cities in South Australia

Purpose

The purpose of stormwater management planning is to:

- Establish objectives for how urban stormwater quantity and quality should be managed within catchments, in an **integrated way**, to protect and enhance the economic, environmental, social and cultural values in the catchment.
- Identify and guide investments that achieve or contribute to achievement of the objectives.

Principles

The following principles underpin effective stormwater management planning:

- Stormwater management planning should be undertaken consultatively with strong efforts made to engage all stakeholders
- Stormwater management planning should be undertaken across whole catchment units, rather than within administrative regions (i.e. local government areas)
- Stormwater management planning should recognise stormwater as an integral part of the urban water cycle
- Structural and non-structural options should be considered to address stormwater management issues
- Options for stormwater management should be comprehensively assessed and selected to maximise social, environmental and economic benefits
- Opportunities to align stormwater management works with the renewal and maintenance of other municipal assets (e.g. roads, footpaths and reserves), new development and redevelopment should be pursued
- SMPs should facilitate a consistent assessment of risks, issues, costs and benefits across different catchments.

Overview of the Process

SMPs are to be prepared by local government authorities, groups of local government authorities, or regional subsidiaries constituted under the *Local Government Act 1999*. While every SMP will be unique, an approach such as the one shown in Figure 1 will assist in ensuring that the SMP is completed and adopted as expediently as possible.

Funding support from the Stormwater Management Fund (SMF) may be available for the preparation of SMPs. Funding support for the preparation of SMPs will be prioritised against those SMPs deemed to be of the highest priority. The SMA has assessed the requirement for SMPs across metropolitan Adelaide and regional South Australia, and has published its priorities for developing SMPs in *Priorities for Stormwater Management Planning in South Australia* (as updated from time to time). The SMA recognises that (particularly for regional areas of South Australia) the listed priorities are not exhaustive. The SMA will therefore give regard to local circumstances and knowledge in determining the need for and priority of additional SMPs not listed. Similarly, the SMA will give due regard to more detailed local knowledge of stormwater issues that may serve to promote of demote the priority of a SMP.

Entities seeking funding support to prepare a SMP should refer to the separate *Stormwater Management Fund Guide for Applicants*.

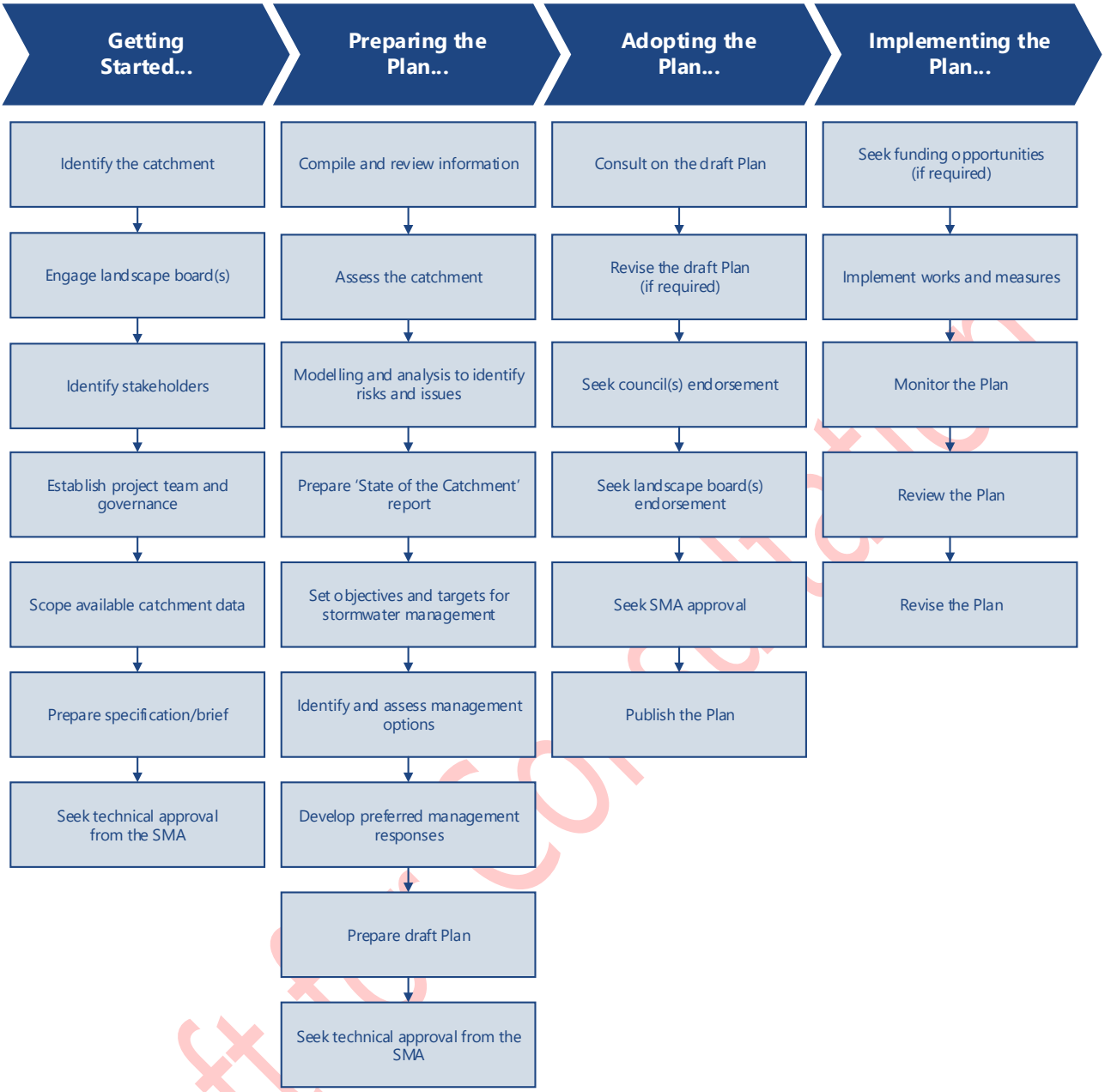

Figure 1 Phases and steps in the stormwater management planning process.

Contents of a Stormwater Management Plan

Appendix B outlines the contents of a typical SMP. Stormwater management planning needs to be adaptable to local conditions and circumstances and there is no requirement to strictly adhere to this structure. Certain key elements are required in every SMP however, as described in Table 2.

Table 2: Key elements of a Stormwater Management Plan

Key SMP Element	Description
Details of how the Plan was Developed	The SMP should describe how the plan was developed, including details of the project governance, stakeholder engagement and involvement, and community consultation undertaken.
Description of the Areas Covered by the Plan	The SMP should include a description that identifies and characterises the area to which the plan applies. The use of maps, figures and tables is encouraged. This section should describe the key economic, environmental, social and cultural values relating to the area. The physical area should be described in terms of its: • Administrative boundaries • Topographic features (including details of receiving waters) • Climate and hydrology (including significant historic events that have impacted the area) • Geology and soils • Land use and population centres.
Description of the Stormwater System(s)	The SMP should provide an overview of the stormwater system(s) in the catchment, including a description of any key pieces of infrastructure, and how the system(s) interact with other stormwater system(s) (e.g. upstream, downstream and adjacent).
Stormwater Issues, Risks and Opportunities	The SMP should describe the stormwater management issues, risks and opportunities identified through analysis using accepted tools and techniques, and supported by evidence wherever possible. The plan should consider not only current risks, issues and opportunities, but also those that are emerging or could potentially emerge in the future as a result of, for example, land-use change, urban development and climate change.
Objectives for Stormwater Management	The SMP should clearly articulate the objectives for stormwater management in the catchment, along with the approach that was taken to develop and refine these objectives
Stormwater Management Options and Strategies	The SMP should contain a detailed discussion of the stormwater management approaches and options considered, culminating in a strategy for adoption. Ideally a broad range of options will be considered that includes structural and non-structural options. These options should be supported by analysis to demonstrate their feasibility, efficacy, costs and benefits. The rationale for the selected options should be clearly described, and a high-level implementation plan provided for the adopted strategy that details priorities for implementation, cost estimate and timeframes. Priorities for implementing projects and activities are to be clearly tabulated together with summary information relating to capital and recurrent costs, timeframes and quantified benefits.
Monitoring, Evaluation and Reporting	The SMP should describe a proposed strategy for monitoring the effectiveness of proposed elements of the SMP once they have been implemented, and the overall progress of implementation of the SMP.

Formatting and Publishing Requirements

SMPs must be provided to the SMA in a digital form but may also be produced in hard-copy.

Maps and figures in SMPs should be of a size, scale and resolution that is conducive to legibility and communicating the information for which they are intended. Maps and their underlying data should be provided to the SMA separately, but as an accompaniment to, the final SMP.

It is expected that the final SMP will be made available under a Creative Commons Attribution (CC-BY) licence (see creativecommons.org.au). Entities are encouraged to publish SMPs on their websites. The SMA may also publish approved SMPs on its website.

Getting Started

Identifying the Catchment

In the context of stormwater management, a catchment is an area that is served by one stormwater system that stands alone from, and is unaffected by, stormwater drainage from an adjoining system, and which drains to a discharge point such as a watercourse or waterbody or the ocean (see Figure 2). It is a general requirement that SMPs be prepared for a whole catchment, however there are exceptions:

- In the case where a catchment may be too small or not sensible for planning purposes. In this case, smaller catchments may be combined with each other, or a neighbouring catchment, for the purposes of preparing a SMP. This is especially relevant where small, adjacent catchments (as can occur along coastal zones) share similar topography, aspect, hydrology and land-use characteristics.
- In the case where a catchment may be very large and impractical for planning purposes. In this case, the catchment may be divided by into smaller units (sub-catchments) and a SMP prepared for the sub-catchment, however the SMP must still consider the impacts from upstream and/or to downstream sub-catchments.
- In the case where isolated developed areas (i.e. towns) exist within a larger rural catchment. In this case, a SMP may be prepared for the developed area only, however the SMP must consider the impacts of the larger catchment on the developed area and the impacts of the developed are on the larger catchment.

Entities seeking to develop a SMP should consult with and gain agreement from their regional landscape board on the area proposed to be covered by the plan.

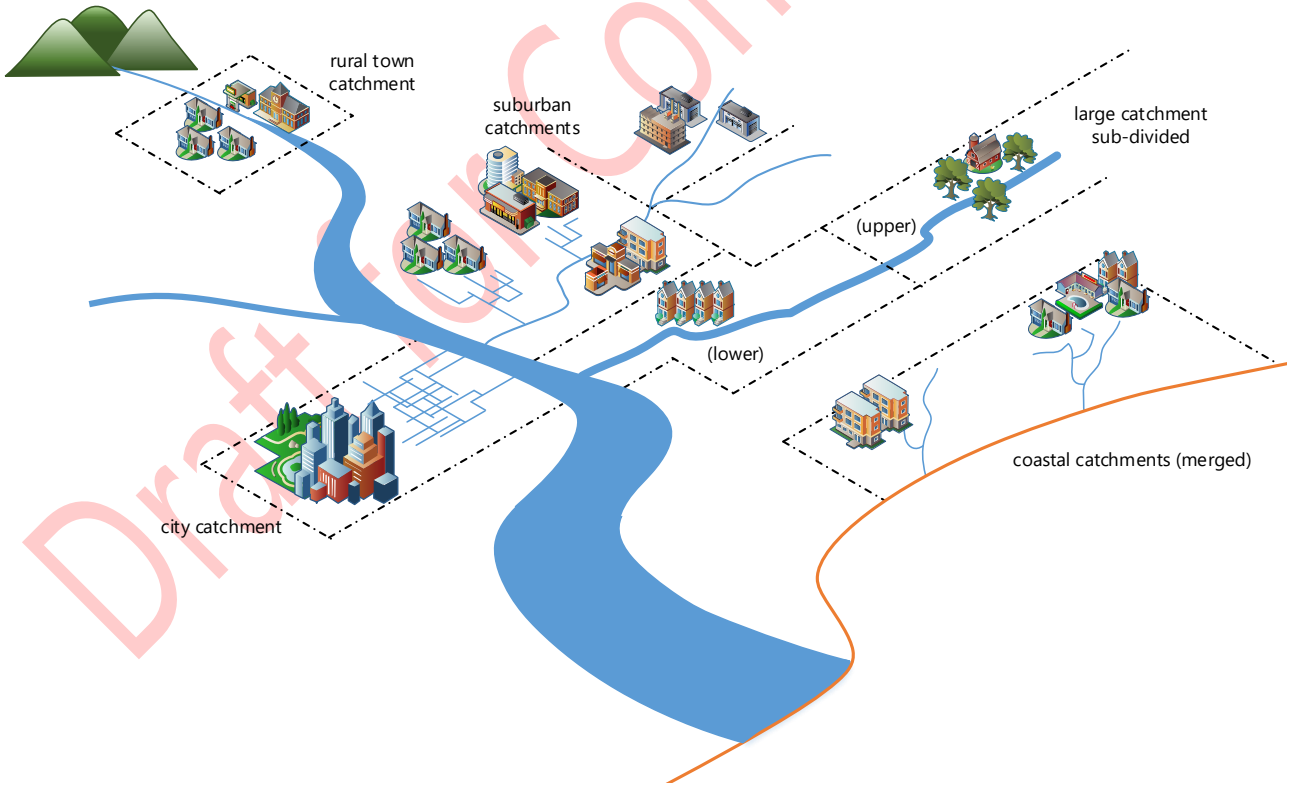

Figure 2 Conceptual illustration of catchments defined for stormwater management purposes.

Identifying Stakeholders

To fully achieve the benefits of integrated stormwater management, SMPs need to be developed in consultation with the communities that live and work in the catchment. These communities are a valuable source of information on stormwater problems in the catchment, and should be identified and engaged as part of the stormwater management planning process. A community engagement strategy should be developed early as part of the planning process.

In addition to the community, a range of other organisations and government agencies will also have a legitimate interest in developing the SMP. These parties should be engaged as may be appropriate at the inception, and throughout development, of the SMP. Some of these organisations are listed in Table 3, however, there may be others that are applicable depending on local circumstances.

When identifying stakeholders, it is important to keep in mind that stormwater issues within the catchment can also have impacts external to the catchment. For example, flood damage to critical infrastructure or degradation of ecosystem function will impact communities who live outside of the catchment as well as communities who live within it.

Table 3: Organisations with an interest in development of Stormwater Management Plans.

Key Stakeholder Organisations
• Local government authorities downstream and upstream of the subject catchment • Department for Environment and Water • Green Adelaide and regional landscape boards • Environment Protection Authority • Department for Infrastructure and Transport • Attorney-General's Department (Planning and Land Use Services) • SA State Emergency Service (or other relevant emergency service such as the Country Fire Service) • SA Water Corporation

Establishing the Project Team and Project Governance

Preparing a SMP can be a technically complex and involved process. It will require drawing together skills and expertise in hydrology and hydraulic modelling, water quality, civil engineering, asset management, emergency management, land-use planning, community engagement and public administration. This will likely be achieved through a mix of internal staff and resources, contractors and consultants, and access to technical resources in stakeholder organisations.

Before commencing work a project approach and governance arrangements should be established that are appropriate for the scale and scope of the SMP being developed. Consideration should be given to the make-up of the project team and governance body, which might require:

- Representatives from each of the local government entities in the catchment
- Representatives from local government entities upstream and downstream of the catchment
- Officers from state government agencies with responsibility for supporting aspects of stormwater management
- Community and industry representatives
- Persons selected to provide independent advice or peer review.

Scoping Available Data

The data and information required to complete a SMP will vary according to the scale and complexity of the catchment. It may not be possible at this stage to fully comprehend the adequacy or inadequacy of available data for the SMP, however a review of available data and information should still be undertaken. This step is necessary so that the consultant's brief or tender documentation can fully appraise prospective tenderers as to the availability of existing data and previous studies.

Preparing the Specification or Brief

After project arrangements have been established, but before commencing work on the SMP, a copy of project brief and/or tender documents should be provided to the SMA for approval. An optional template project brief is available from www.sma.sa.gov.au.

The project brief should reference the latest guidelines and reference documents, which are listed in the template project brief and also in Appendix C.

Preparing the Plan

Collating and/or Collecting Data

Data and information need to be collated to describe the catchment, and to support the analysis that will be required to complete the SMP. Much of the data and information required will be held by (or be accessible to) local government authorities, but it is likely that some additional data will need to be collected.

In particular, data on stormwater infrastructure in the catchment will need to be available. It is recognised that not all stormwater infrastructure is in public ownership. Information on privately owned stormwater infrastructure will need to be collected to the extent that that data is necessary to complete the SMP[2].

Baseline Assessment of the Catchment

Before the SMP can be developed the state and condition of the catchment should be established. This will provide a baseline by which the effectiveness of management options developed as part of the SMP can be assessed. This state and condition assessment should describe:

- The topographic form of the catchment and key influences, including land-use, geology and soils
- The climate and hydrology, including interactions with groundwater or coastal waters
- Environmental values of the catchment[3,4], including, where applicable, threatened and ecological communities, assessment of watercourse condition, environmental flow requirements, and impacts on marine environments
- Social, socio-economic and cultural values of the catchment
- Water demand and supply in the catchment
- The stormwater network in the catchment and arrangements for its management
- Development policy in the catchment
- Any other identified issues(s) or influence(s).

Identifying Issues, Risks and Opportunities

The stormwater management planning process should identify the stormwater management issues and risks in the catchment, as well as opportunities for realising public and environmental benefits through infrastructure and stormwater management practices. Examples of the types of issues, risks and opportunities that should be considered are provided in Table 4.

It is at this stage of development of the plan that one or more numerical modelling tools may need to be employed to help identify the issues, risks and opportunities. Modelling tools and software packages should be selected from the range of commercially and freely available packages that have broad acceptance among the engineering and academic

[2] The SMA will generally not fund the collection of data relating to an entity's owned stormwater infrastructure. This activity is considered a core asset management responsibility of the entity. The SMA will fund the collection of data relating to stormwater infrastructure that is not owned by the entity, to the extent that that data is necessary to complete the SMP.

[3] The environmental values for South Australian waters have been established under the *Environment Protection (Water Quality) Policy 2015* and these must be considered where relevant.

[4] The social and cultural values of Adelaide coastal waters have been established as part of the *Adelaide Coastal Waters Quality Improvement Plan* and these should be considered for catchments that discharge to Adelaide coastal waters either directly or indirectly.

communities. In any case, modelling methods should be based on accepted practices described in contemporary guidance documents such as those listed in Appendix C and other guidance issued by the SMA from time-to-time.

Insofar as is possible, numerical models should be calibrated, and their outputs supported by evidence in the form of observed data, historic records and anecdotal observations.

Table 4: Examples of stormwater management issues, risks and opportunities.

Issues and Risks	Opportunities
• The frequency and behaviour of floods within the catchment • The economic, environmental and social impact(s) of flooding • The likely effects of future development and climate change on the frequency and behaviours of floods within the catchment • Degradation of receiving environments due to the quantity and/or quality of stormwater runoff • The economic, environmental and social impact(s) of stormwater pollution • The likely effect of future development and climate change on the degradation of receiving environments • Poor community understanding of the cumulative impacts of stormwater management practices on, for example, aquatic health and flood risk • Limited monitoring of the effectiveness of and compliance with actions intended to manage stormwater issues	• Development controls and better integration of SMPs with development plans • Incorporating water-sensitive urban design principles in new development and redevelopment • Incorporating water-sensitive urban design principles in asset renewals and better integration of SMPs with municipal asset management plans • Stormwater reuse (including aquifer storage and recovery) • Managing stormwater quality and quantity 'at source' rather than 'end of pipe' • Enhancement of receiving environments due to improvements in the quantity and/or quality of stormwater runoff • Enhancement of the amenity and utility of public and recreational spaces • Implementation of non-structural measures to manage flood risk such as warning and preparedness • Implementation of non-structural measures to improve stormwater quality, such as education, compliance and street sweeping programs

Setting Objectives, Goals and Targets

The SMP should set catchment specific objectives for the management of stormwater within the catchment. These objectives should be set in consultation with key stakeholders and should be responsive to the economic, environmental, social and cultural values identified previously, *and* minimum performance standards set by policies and plans such as those listed in Table 1.

When choosing catchment specific objectives, consideration should be given to (but not limited to):

- Achieving a level of flood protection for the community and private and public assets in the catchment that is both acceptable to and affordable by the community
- Managing the quantity and quality of runoff to receiving waters to maintain or improve the ecological health of waterbodies and watercourses
- Improving the state and condition of coastal and riparian ecosystems
- The retention and use of stormwater for recreation, amenity and other beneficial uses
- Provision of open space, recreational areas and public amenity
- Replacing 'traditional' stormwater infrastructure with 'water sensitive' infrastructure
- The long-term operation and maintenance requirements of stormwater infrastructure.

A set of model objectives is provided at Appendix D. These may provide a useful starting point for the development of specific SMP objectives, goals and targets.

Identifying and Evaluating Management Options

The SMP should present a coordinated and multi-objective strategy for stormwater management in the catchment, involving studies (if needed), works and actions. Defining the strategy will involve identification of potential management options for achieving the catchment specific stormwater management objectives.

Appendix C lists references that may assist in the identification of a range of suitable stormwater management options. Structural and non-structural options must be considered as part of a holistic SMP. Non-structural options include:

- The formulation and implementation of planning policies associated with development and redevelopment
- Community education programmes
- Compliance programmes.

Potential options will need to be evaluated to determine their feasibility, efficacy and cost. This will require analysis that will most likely employ the same modelling tools and software packages used earlier in developing the SMP. The same provisions will apply to using models tools with respect to employing sound and accepted analysis methods and practices.

The benefits of different management options should preferably be stated in terms of a quantifiable measure, such as reduction in average annual flood damage (AAD), reduction in number of properties affected by flooding, amount of water harvested in an average year or amount of pollutant removal. Non-structural options may be more challenging to quantify and compare to structural options, however non-structural options must be considered as part of a holistic SMP. Where it is not possible to provide a quantitative measure for an option, a qualitative assessment of the impact of the option is to be provided.

The evaluation should be used to refine all potential options into one (or a few) preferred options that will achieve the objectives set for the SMP. The SMP should make a clear recommendation as to which management options should be implemented. It is possible that through the evaluation and selection of management options that the objectives set above may need to be modified to achieve a cost effective feasible solution that takes account of constraints within the catchment and other socio-political factors.

Determining Priorities and Timeframes for Implementation

The recommended management options should be prioritised for implementation with a planning horizon of ten years. While actions that reduce the hazard to life and property will naturally be afforded a high priority, those actions that achieve multiple objectives such as water use, water quality improvement, environmental enhancement and the provision of open public space should be weighted favourably.

An estimation should be provided for all of the capital and operating costs associated with the recommended options, and where costs and benefits are shared between two entities (e.g. adjoining councils) the apportionment of costs between those entities should be decided based on mutually agreed principles and set out for each project[5].

Information in SMPs may later be relied on by the SMA (and others) to assess relative priorities for investment across catchments in South Australia.

Adopting the Plan

Public Consultation

While it is expected that stakeholders and the community will have been engaged throughout the development of the SMP, there must be a deliberative period of public consultation on the draft SMP before it can be submitted for approval.

[5] The SMA will only become involved in cost sharing disputes where the entities are unable to agree. In such cases an amount equivalent to the costs incurred by the SMA to resolve the cost sharing dispute will be withheld from each relevant share of the SMA's subsidy toward the relevant project as determined by the SMA.

Section 50 of *Local Government Act 1999* requires councils to prepare and adopt public consultation policies. Council policies may also provide for broader consultation activities when considered appropriate and depending on local circumstances. In most cases public consultation should be undertaken in accordance with the entities public consultation policy prepared as a requirement of Section 50.

The initiating entity (or entities) must demonstrate that the preferred management option identified in the SMP have broad stakeholder support. The SMA recognises that public works projects often elicit divergent views and opinions from members of the public. The requirement for broad stakeholder support should not therefore be construed as a requirement for unanimous support, but rather, it should be demonstrated that opposing stakeholder views have been reasonably weighted and balanced appropriately.

Council Endorsement

The draft plan should be provided for endorsement by a meeting of elected members of council[6]. Advice that council has endorsed the SMP should be provided to the SMA with a copy of the relevant resolution passed at a council meeting.

Obtaining Landscape Board Comment

Regional landscape boards have a legislated responsibility to consider any SMP prepared for any catchment that falls within their landscape region. Landscape boards must advise the SMA whether, in their opinion, the SMP contains 'appropriate provisions' (for the management of stormwater). The SMA cannot approve a SMP without such advice. Therefore, it is recommended that entities preparing a SMP both:

- Work with their regional landscape board(s) throughout the development of the SMP; and,
- Refer their completed draft SMP to their regional landscape board(s) as soon as is practicable.

SMA Approval

The SMA will make arrangements for the SMP to be approved by a resolution of the SMA Board and will publish a notice of approval in the South Australian Government Gazette.

Approval of a SMP does not represent a commitment or approval by the SMA of any funding contribution towards the implementation of the SMP.

Implementing the Plan

Once a SMP becomes an approved SMP, entities should begin to implement the identified management actions using available resources. Entities can apply for funding support for eligible projects identified in the SMP through the Stormwater Management Fund (SMF). Applicants should refer to the *Stormwater Management Fund Guide for Applicants*.

Other state and Commonwealth government grants and subsidies may be available to assist with implementation of SMPs.

Monitoring the Plan

On occasion, proposed management actions will need to be modified, promoted in priority or demoted in priority as a result of unforeseen circumstances and external factors. It is expected that entities will routinely re-appraise their management actions, priorities and progress towards implementation and make adjustments as required.

Entities should ensure that they have appropriate arrangements in place to monitor:

- The implementation of the overall SMP; and
- The effectiveness of the works and measures completed.

[6] In the case of a SMP prepared by two or more councils, there is no requirement for the SMP to be endorsed by a joint sitting of those councils.

SMF support for the preparation of SMPs may be made subject to a requirement for entities to report progress against SMP implementation at frequency of not less than every three years.

Reviewing the Plan

SMPs should be periodically reviewed to take account of current knowledge, changing conditions within the catchment, changes to legislation and planning provisions, and changing community attitudes to the management of stormwater and other water resources making up the urban water cycle. To ensure that this occurs, it is expected that the SMPs will be reviewed at least every ten years and that proposed works and strategies to be adopted for the subsequent ten-year period will be identified.

Other References

Priorities for Stormwater Management Planning in South Australia

Stormwater Management Fund Guide for Applicants

SMA Circulars

See also Appendix C

Acronyms

AAD	annualised average damages
AEP	annual exceedance probability
BCR	benefit cost ratio
SMA	Stormwater Management Authority
SMF	Stormwater Management Fund
SMP	stormwater management plan

Further Information

For more information contact:

Stormwater Management Authority
Level 5, 81-95 Waymouth Street, Adelaide
c/- GPO Box 1047, Adelaide, SA, 5001
Telephone: (08) 8124 4787
Email: sma@sa.gov.au

Appendix A: Checklist for a complying SMP (normative)

Development of the Plan

- ☐ Does the plan describe which stakeholders were engaged and how they were engaged in the development of the plan?
  - ☐ Has the plan been endorsed by the relevant Council(s)?
  - ☐ Has the plan been assessed by the relevant NRM Board?
- ☐ Does the plan describe how the relevant community/ies have been consulted?
  - ☐ Has community feedback been considered, or adequate justification provided for not considering community feedback?

Description of the Area

- ☐ Is the catchment to which the plan applies clearly described?
  - ☐ Are administrative boundaries described and/or shown clearly on a map?
  - ☐ Are general topographic features described and/or shown clearly on a map?
  - ☐ Have key population centres been identified?
- ☐ Is the climate and hydrology described?
  - ☐ Have historic flood events been referenced or documented?
  - ☐ Does the plan consider future climate change impacts on hydrology?
- ☐ Are the relevant near surface geological features and soils described?
- ☐ Has land-use and land-use planning been discussed?
  - ☐ Have future land-use changes been considered (including 'infill' development)?
- ☐ Have the economic, environmental and social and cultural values relevant to the catchment been identified?

Stormwater Infrastructure

- ☐ Does the plan include a description of the stormwater infrastructure within the plan area?
  - ☐ Is this description supported by adequate maps and figures?
- ☐ Does the plan include general discussion on the age and condition of stormwater infrastructure?
- ☐ Does the plan identify (or reference in an external Asset Management Plan) actual and desired levels of service for stormwater infrastructure?
- ☐ Does the plan identify any significant stormwater infrastructure outside of public ownership that is critical to the implementation of the SMP?

Stormwater Issues, Risks and Opportunities

Drainage and Flooding

- ☐ Does the plan describe flood behaviour within the catchment or area?
- ☐ Does the plan quantify and describe flood hazard within the catchment or area?
- ☐ Does the plan quantify and describe the social, economic and environmental impacts of flooding in the catchment or area?
- ☐ Does the plan consider the positive and negative impacts of future development on flooding?
- ☐ Does the plan consider the positive and negative impacts of future climate change on flooding?
- ☐ Have opportunities to reduce flood risk to existing and future development been considered?
- ☐ Does the plan consider non-structural opportunities for managing flood risk including flood warning, flood preparedness and development controls?

Water Quality

- ☐ Does the plan consider the positive and negative impacts of stormwater on receiving waters and/or downstream areas?
- ☐ Have opportunities to reduce adverse impacts on watercourses and receiving waters been considered?

Stormwater Use

- ☐ Does the plan consider opportunities for beneficial stormwater use?
- ☐ Does the plan consider opportunities for managing stormwater to enhance water dependent ecosystems?
- ☐ Does the plan consider opportunities to provide improve recreational or amenity value of public land?
- ☐ Is adequate justification provided where there are no opportunities for stormwater use are identified?

Stormwater Management Objectives

Do the chosen objectives for stormwater management:

- ☐ Provide an acceptable level of flood protection for life and public and private property?
- ☐ Provide for managing the quality of stormwater runoff contributing to receiving waters and downstream areas?
- ☐ Set desirable end-state values for watercourses and riparian ecosystems?
- ☐ Set desirable land-use planning outcomes associated with new development, open space, recreation and amenity?
- ☐ Provide for the sustainable asset management (including operation, maintenance and renewal) of stormwater infrastructure?

Stormwater Management Options

- ☐ Does the plan adequately analyse and describe the options that were investigated for stormwater management?
  - ☐ Have non-structural options for stormwater management been considered?
  - ☐ Have the economic, environmental and social and cultural costs and benefits of each option been properly evaluated?
    - ☐ Are reductions in flood damages quantified?
    - ☐ Are stormwater reuse yields quantified?
    - ☐ Where costs and benefits cannot be quantified, have they been discussed qualitatively?
  - ☐ Does the plan provide adequate justification where options have been discarded or not investigated?
- ☐ Does the plan make a clear recommendation as to the preferred option(s) for adoption?
- ☐ Do the recommended options strike a balance between economic costs and benefits and environmental and social and cultural costs and benefits?
- ☐ Do the recommended options include consideration of all the relevant stormwater issues?
  - ☐ Do the recommended options reduce flood risk to existing and future development?
  - ☐ Do the recommended options reduce adverse impacts on receiving waters or downstream catchments?
  - ☐ Do the recommended options maximise reuse of stormwater?
  - ☐ Do the recommended options promote open space, recreation and amenity outcomes?
- ☐ Are the recommended options sufficient to achieve the stormwater management objectives?

Management Plan

- ☐ Are the recommended options for stormwater management clearly identified in a table or similar summary?
  - ☐ Are the relative priorities of the recommended options clearly shown?
  - ☐ Are the resource requirements (capital and operating expenditure) of the recommended options identified/estimated?
  - ☐ Has the contribution split between parties been identified (where relevant)?
  - ☐ Are responsibilities for implementation identified?
  - ☐ Are activities and works which are eligible for Stormwater Management Fund support flagged as such?

Monitoring, Evaluation and Reporting

- ☐ Does the plan propose a strategy for monitoring, evaluation and reporting on the implementation of the plan?
- ☐ Does the plan propose a strategy for monitoring, evaluation and reporting on the effectiveness of the Management Plan?

Miscellaneous

- ☐ Is the plan provided complete with all appendices?
- ☐ Are maps and figures clear and legible?
- ☐ Do maps have sufficient labelling to orient the reader?

Appendix B: Outline of a typical SMP (informative)

Acknowledgements

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Monitoring, Evaluation and Reporting

References

Appendices

Appendix C: Useful References (informative)

Title	Publisher	Edition	Internet Reference
Adoption guidelines for stormwater biofiltration systems	Cooperative Research Centre for Water Sensitive Cities	2015	watersensitivecities.org.au/content/stormwater-biofilter-design
Australian & New Zealand guidelines for fresh and marine water quality	Water Quality Australia	2019	www.waterquality.gov.au/anz-guidelines
Australian rainfall and runoff	Geoscience Australia	2016	arr.ga.gov.au
Australian runoff quality	Engineers Australia	2006	www.eabooks.com.au/Australian-Runoff-Quality-Guide-to-Water-Sensitive-Urban-Design
Coastal erosion, flooding and sea level rise standards and protection policy	Coast Protection Board (SA)	1992	www.environment.sa.gov.au/topics/coasts/research-reports-policies
Coastal planning information package. A guide to coastal development assessment and planning policy	Department for Environment and Water (SA)	2013	www.environment.sa.gov.au/topics/coasts/research-reports-policies
Disaster loss assessment guidelines (Manual 27)	Australian Institute for Disaster Resilience	2002	knowledge.aidr.org.au/resources/manual-series
Flood modelling guide (Circular 1)	Stormwater Management Authority	2020	www.sma.sa.gov.au/resources/guidelines
Flood preparedness (Manual 20)	Australian Institute for Disaster Resilience	2009	knowledge.aidr.org.au/resources/manual-series
Guidelines on the consequence categories for dams	Australian National Committee on Large Dams	2012	www.ancold.org.au/
Guidelines for digital elevation data	Inter-governmental committee of surveying and mapping	2008	www.icsm.gov.au/publications/icsm-guidelines-digital-elevation-data
Implementing water sensitive urban design in stormwater management plans (Technical report series no. 16/7)	Goyder Institute for Water Research	2016	www.goyderinstitute.org/publications/technical-reports
INFFEWS value tool: Guideline	Cooperative Research Centre for Water Sensitive Cities	2020	watersensitivecities.org.au/content/inffews-value-tool-guideline-version-3
International infrastructure management manual	Institute of Public Works Engineering Australia	2015 (5th ed)	www.ipwea.org/publications/ipweabookshop/iimm
Condition assessment and asset performance guidelines: Stormwater drainage (Practice note 5)	Institute of Public Works Engineering Australia	2015	www.ipwea.org/publications/ipweabookshop/practicenotes/practicenote5
Managed aquifer recharge and stormwater use options: Net benefits report (Technical report series no. 14/1)	Goyder Institute for Water Research	2014	www.goyderinstitute.org/publications/technical-reports

Title	Publisher	Edition	Internet Reference
Managing the floodplain: A guide to best practice in flood risk management in Australia (Handbook 7)	Australian Institute for Disaster Resilience	2017 (3rd ed)	knowledge.aidr.org.au/resources/handbook-managing-the-floodplain
Flood emergency response classification of the floodplain (Guideline 7-2)	Australian Institute for Disaster Resilience	2017 (2nd ed)	knowledge.aidr.org.au/resources/handbook-managing-the-floodplain
Flood hazard (Guideline 7-3)	Australian Institute for Disaster Resilience	2017 (2nd ed)	knowledge.aidr.org.au/resources/handbook-managing-the-floodplain
Flood information to support land-use planning (Guideline 7-5)	Australian Institute for Disaster Resilience	2017	knowledge.aidr.org.au/resources/handbook-managing-the-floodplain
Assessing options and service levels for treating existing risk (Guideline 7-6)	Australian Institute for Disaster Resilience	2017	knowledge.aidr.org.au/resources/handbook-managing-the-floodplain
Considering flooding in land-use planning activities (Practice Note 7-7)	Australian Institute for Disaster Resilience	2017	knowledge.aidr.org.au/resources/handbook-managing-the-floodplain
MUSIC water quality modelling guidelines	Water Sensitive South Australia	2020	www.sma.sa.gov.au/resources/guidelines
Riparian design guidelines to inform the ecological repair of urban waterways	Cooperative Research Centre for Water Sensitive Cities	2017	watersensitivecities.org.au/content/riparian-design-guidelines-inform-ecological-repair-urban-waterways
Stormwater asset data requirements for hydraulic models (Circular 3)	Stormwater Management Authority	2020	www.sma.sa.gov.au/resources/guidelines
Water sensitive urban design technical manual	Attorney-General's Department (SA) (Planning and Land Use Services)	2010	www.sa.gov.au/topics/planning-and-property/land-and-property-development/planning-professionals/water-sensitive-urban-design

Appendix D: Model SMP Objectives and Targets (informative)

Objective	Target(s)
Provide an acceptable level of flood protection for public and private assets	No over-floor flooding of habitable dwellings in a flood event with an annual exceedance probability (AEP) of 1% or less
	Safe vehicle access (defined by low hazard category) along state and local arterial roads in a flood event with an annual exceedance probability (AEP) of 1% or less
	No private property is subject to high or extreme hazard in a flood event with an annual exceedance probability (AEP) of 1% or less.
	No roadways or properties in residential zoned areas are subject to high or extreme hazard in a flood event with an annual exceedance probability of 20%
	No roadways or properties in commercial/industrial zoned areas subject to high or extreme hazard in a flood event with an annual exceedance probability of 10% or more
	Adequate flood warning systems are in place and information regarding flood risk is provided to the community
	Effective emergency management arrangements are in place and engage all relevant agencies, staff and affected communities
Improve quality of runoff to terrestrial and marine receiving waters	Compared to the 'untreated' case, achieve a reduction in total suspended solids of 80%
	Compared to the 'untreated' case, achieve a reduction in total Phosphorous of 60%
	Compared to the 'untreated' case, achieve a reduction in total Nitrogen of 45%
	Compared to the 'untreated' case, achieve a reduction in litter/gross pollutants of 90%
	Manage flow rates, volume, duration and frequency of stormwater entering watercourses to mimic natural flow regime
Increase the beneficial use of stormwater	Increase use of recycled stormwater in the catchment by X%
	Maximise the capture and re-use of stormwater runoff at and near source
Improve the condition of riparian ecosystems	Maintain and where possible restore water-dependent ecosystems by providing their water needs and addressing detrimental impacts from water affecting activities
	Maintain hydrological and hydrogeological systems, including natural discharge and recharge between water resources
Planning for new developments provides for open space, recreation and amenity	Ensure planning and design policies and procedures are in place which effectively manage development to minimise impact of flooding on new and existing development
	Ensure planning and design policies and procedures are in place which promote integrated planning, design and management of stormwater systems to maximise the potential to achieve multiple outcomes for water management in new development, as well as redevelopment, retrofits, upgrades and extension works.
	Ensure planning and design policies are provided which provide for protection and enhancement of natural features and systems wherever possible
Sustainable asset management of stormwater infrastructure	All (100%) of stormwater assets are identified and recorded in an asset management system and/or asset management plan
	All (100% of) WSUD assets have an operation and maintenance plan in place