Tender for Mellissa Bradley Consulting
(as Program Manager for Water Sensitive SA)

Water Sensitive SA –
Online Stormwater Assessment Tool

Request for Tender

Tender No: T16.17.001

Contract No: 16.17.001

6 Section D – Project Brief for the Services

6.1 Overview

Greater metropolitan Adelaide and several regional Councils are contending with the stormwater management challenges associated with the cumulative impacts of small-scale developments (refer to Box 1) within highly urbanised areas.

Water Sensitive SA, on behalf of our partners, is seeking to develop an on-line stormwater assessment tool for small-scale or simple developments, and an associated guideline that can foster the adoption of water sensitive urban design (WSUD) techniques while offering increased efficiency in the development approval process.

Box 1 – Definition of small-scale development

For the purpose of this brief, small-scale developments are defined as:

1. Residential developments, including
    a. additions over 50m^2
    b. single dwellings
    c. dual occupancies
    d. unit/townhouse developments excluding those that incorporate the creation of a public road
    e. Apartment blocks
2. Commercial, industrial and institutional developments of up to 5,000m^2

The project will be developed in three stages:

Stage 1 – Comparison of current Council engineering requirements

Stage 2 – Development of stormwater assessment tool and guideline for Greater Adelaide

Stage 3 – Development of online interface for stormwater assessment tool & user manual

Stage 4 – Maintenance and update of the tool and website

The decision to advance to each subsequent stage will be dependent on the outcomes of the preceding stage to the satisfaction of the Project Management Group.

There is the potential to expand the tool into South Australian regional growth areas (Stages 4 & 5), subject to additional investment.

6.2 Background and context

Small-scale infill development is increasing the imperviousness of our suburbs without appropriate consideration of the impacts on stormwater quality and quantity, amenity and urban heat island effects, affecting overall liveability of our communities. Under the 30 Year plan for Greater Adelaide, 70% of new housing is sought from within the existing planning boundaries and the balance from new urban growth areas on the city fringes. This target for housing stock sought via infill is expected to increase to 80% under the current 30 Year Plan review. The stormwater drainage systems within established suburbs have not, in most cases, been designed to accommodate the higher proportion of directly connected impervious areas under the proposed infill scenario.

While some may consider that infill development offers limited opportunities for innovation in water management, a shift in approach is needed to reduce flood risk, reduce pollutants entering our watercourses and marine environment, and reduce the heat island effect – all exacerbated by highly impervious areas.

Many Councils currently require on-site detention systems for infill developments to manage peak storm outflow rates, however, there is a growing desire within the Local Government and the Environment Protection Authority, to see a broader range of options for stormwater management in smaller, infill developments that provide multiple benefits including water quality, amenity and microclimate.

A further challenge facing Local Government is that the development industry within the small-scale residential and commercial market has variable capability in the interpretation and application of stormwater detention and retention policies, which is leading to significant inefficiencies in the development application and approval process.

A simple tool is therefore required to assist industry assess the adequacy of the size of proposed WSUD elements, in particular stormwater management solutions, including: on-site retention, on-site detention, raingardens, swales, permeable paving, reduced footprint of impervious areas and reduced impervious areas directly connected to Council stormwater drainage systems.

Developments within Residential Code zoned areas, the *Development Regulations 1993* do not require stormwater detention for peak volume or flow management for single dwellings or extensions. Building rules still apply for the minimum 1,000L retention tank requirement for water conservation outcomes, for new dwellings or alternations greater than 50m^2 in area.

It is understood that under the *Planning, Development and Infrastructure Bill 2016* a greater proportion of developments will fall outside of a merit based assessment and are likely to be subject to third party approvals. In the absence of a detailed assessment for a given small scale development, an online stormwater assessment tool can provide a greater level of surety of the adequacy of a proposed design to meet the WSUD performance objectives for Councils and development applicants alike.

A mechanism is needed to integrate the Building Code of Australia (BCA) stormwater requirements for stormwater retention, with any requirement for stormwater discharge quantity management for flood mitigation via retention to provide flexibility for a single storage, if the applicant so chooses. At present, many applicants construct two rainwater storages to satisfy the differing BCA and planning (engineering) requirements, unnecessarily taking up additional space in allotments that already have limited private outdoor space.

The traditional approach to minor system flood mitigation has been the inclusion of stormwater detention requirements for new developments to manage peak flows. In some Council areas, catchment conditions dictate that the overall volume discharged is also a critical design factor and therefore retention is being sought in lieu of detention requirements, as described within the *Cities of Marion and Holdfast Bay Stormwater Management Plan* Tonkin Consulting (2013).

A reduction in the overall footprint of the impervious area of a proposed development, in particular the roof area, is one option an applicant may consider to assist compliance with the SA WSUD policy (refer to Appendix 2 for an extract and design performance targets. A tool that allows the applicant to trial scenarios of different dwelling roof areas, coupled with other WSUD elements, will assist in bringing about awareness of the benefits of a reduced dwelling (and ancillary building) footprint. The associated opportunities to retain private green space, which enables the use of raingardens, swales etc for stormwater run-off management and passive infiltration, together with providing cooling

benefits for our suburbs, can be brought to the attention of the development applicant through the on-line tool.

6.3 Project objective

To provide a user friendly online tool for small-scale developments that assesses the performance of the proposed WSUD elements of a development against the nominated design criteria (SA WSUD Policy), and an associated guideline and user manual, to:

- increase the efficiency of development application and approval processes, and
- achieve better outcomes for flood risk, stormwater quality, amenity and microclimate (where possible).

6.4 Project outputs

The project deliverables are:

6.4.1 An online stormwater assessment tool that:

6.4.1.1 provides a user decision support framework that guides development applicants through an assessment processes that:

6.4.1.1.1 provides for flexibility if the relevant Council seeks either detention or retention, including infiltration, as the preferred method to meet stormwater management objectives.

6.4.1.1.2 seeks solutions consistent with the *Planning Act 1993*, *Planning Regulations 1993*, Council Development Plans and the Building Code of Australia, SA amendment, e.g. providing for flexibility for amalgamation of storages for water conservation (BCA) and retention (Planning Act, Regulations, Minister's Specification 78AA etc) and Australian Standards

6.4.1.2 provides for a range WSUD solutions for small-scale or simple developments to be assessed for their degree of compliance with the SA WSUD policy and the nominated policy described in Section 5.1, including:

6.4.1.2.1 onsite solutions, including, but not limited to, the calculation of:

- detention systems that utilize above ground surface ponding including: (a). volume calculation for storage area, (b). detention calculations that confirm required storage volume, (c). orifice diameters for outlet controls
- detention systems that have above ground tanks including: (a). calculations to confirm gutter capacity (BCA generally requires only 20yr ARI roof gutter capacity), (b). detention calculations that confirm required storage volume, (c). orifice diameters for outlet controls
- Retention storage volumes,
- Raingarden areas (assuming a standard soil media profile), swales and infiltration systems areas (assuming a standard cross section, to be approved by client, and soil type in accordance with SA Soil maps)

- Green roof areas (assuming a standard soil media profile and overflow systems, to be approved by client)

6.4.1.3 Has spatial reference capability to enable location specific data to be drawn into the model, e.g. rainfall data. Note: selected rainfall gauging stations incorporated into the tool shall have a minimum of 10 years continuous data, representative of long term average data.

6.4.1.4 Provides for ease of editing such that variables can be readily amended by the Client to accommodate any changes in policy or similar, e.g. amendments to South Australian Government pollutant load reduction targets.

6.4.2 An **accompanying guideline,** of approximately 20 x A4 pages, suitable for development applicants, that provides:

6.4.2.1 A brief overview of the WSUD principles

6.4.2.2 A brief overview of the relevant policy and performance targets

6.4.2.3 A brief description of the benefits of integrating each design element/stormwater management option, emphasising the need for reduced impervious areas directly connected to Councils stormwater drainage infrastructure

6.4.2.4 a range of combinations of WSUD solutions that meet the performance criteria for the following development types:

6.4.2.4.1 an addition 50m^2 or greater,

6.4.2.4.2 a single allotment,

6.4.2.4.3 one allotment subdivided into two

For 7.4.2.4.1 to 7.4.2.1.3 prepare simple rules of thumb represented in tabular form, or similar, (subject to assumptions relevant to site), that meet the water quantity design criteria only as set out in Section 5 of this brief. Sizing of storages shall be calculated for the following roof areas directly connected to the storage: up to 50m^2, 100m^2, 150m^2, 200m^2, 300m^2 and 400m^2. Options to increase retention storage in lieu of detention shall be included.

Example for demonstration purposes only:

Connected roof area 150m^2	Detention storage L	Retention Storage (connected toilet only) L	Retention storage (connected laundry only) L	Retention storage (connected toilet and laundry) L	Retention (infiltration) m^3
Option 1					
Option 2					
Option 3					
Option 4					
Option 5					

Option 6					

- Clearly document assumptions under which any tables/charts apply, including existing site coverage, proposed site coverage, offsets of raingardens from structures and footings etc and outlines when deemed to comply solutions cannot be used.

6.4.2.4.4 one allotment subdivided into three

6.4.2.4.5 one allotment subdivided into five

6.4.2.4.6 two allotments into 10, that does not include the creation of a public road (or similar)

6.4.2.4.7 attached townhouses/ apartment block

6.4.2.4.8 a commercial development

Note: one allotment is assumed to be the standard quarter acre block or 1010m^2.

6.4.2.5 a list of documents where further information can be obtained (websites and literature)

6.4.2.6 a list of development or scenarios where on-site detention or retention, including infiltration, may be the preferred option

Note: Refer to Water Sensitive Urban Design Compliance guidelines for new development, March 2014, City of Mooney Valley for an indication of the nature and scale of the guideline sought.

6.4.2.7 standard engineering drawings and related specifications for the WSUD design elements in accordance with the assumptions of standard dimensions/cross sections within the model, including:

- retention systems: storages below and above ground,
- retention systems: infiltration
- detention systems: below and above ground, surface storage/ponding, including:
  - pump requirements
  - typical orifice diameters and installation detail
  - detention area signage
- a typical raingarden design, nominating the depth of filter media layers assumed in the calculations: raingarden design shall be in accordance with: the CRC for Water Sensitive Cities Adoption Guidelines for Stormwater Biofiltration systems July 2015 the EPA Raingarden 500 Guidelines. For any anomalies between the two documents, the EPA Guidelines shall prevail over the CRC Guideline
- permeable paving
- swales
- green roofs.

6.4.3 A **user's manual** describing how to use the online tool, a description of the models and methods used, worked examples showing the calculations that form the bases of the assessment and any assumptions in the modelling.

6.4.4 An **operator's manual** to enable the Client to address minor maintenance issues or make minor edits to the model and/or tool, for example amendment to pollution load reduction targets due to State Policy amendments etc.

6.4.5 Provide **pre-application advice and checklist fact sheet** of documentation to be submitted to Council or relevant third party assessor with each application, including but not limited to:

- Site layout plan requirements
- Design details for example: location and type of paved surfaces (ie indicating if pervious or impervious), size rainwater tank/s and what they are connected to; cross sections of raingardens/swales
- Catchment plan, detention calculations, tank model and size, head height and orifice size required
- Has detention volume and orifice size been indicated on drainage plan?
- Have appropriate construction details been provided?
- Has detention area/storage signage been provided?

6.5 Design criteria/characteristics:

The on-line stormwater assessment tool shall:

6.5.1 Be capable of assessing the performance of the proposed WSUD elements against the water conservation, stormwater quality and stormwater quantity performance measures detailed below.

(i). Water conservation – retention (BCA)
For developments or additions of greater than 50m^2, rainwater from a minimum of 50m^2 of the roof catchment areas must be collected by the gutters and downpipes; stored in a rainwater tank with a minimum capacity of 1,000L and plumbed to:

- a toilet
- water heater (hot water service), or
- laundry outlets.

(ii) Water quantity (flood management) via:

(a) supplementary retention and
(b) detention.

SA Water Sensitive Urban Design Policy
For development and other relevant infrastructure that will drain run-off to an existing publicly managed drainage system or to a drainage system such as a creek or watercourse on privately-owned land:

- the capacity of the existing drainage system is not exceeded

- there is no increase in the five year ARI peak flow compared to existing conditions
- no increase in flood risk for the 100 year ARI peak flow compared to existing conditions.

Performance measure for watercourse stability – all development types

Post development peak rate of run-off from the development site for the critical design storm does not exceed the pre-urban development 1 year average recurrence interval (ARI) peak flow.

Note: applicable to sites that discharge to an unlined watercourse (Include question in decision support framework preceding model calculations)

Performance measure – residential development

Post development peak rate of run-off from the development site for the critical design storm shall not exceed that from the pre-development site from a 5 year ARI storm.

Performance measure – commercial, industrial and institutional development

Post development peak rate of run-off from the development site for the critical design storm shall not exceed that from the pre-development site from a 10 year ARI storm.

Performance measure – major system/overland flow

Post development peak rate of run-off from the development site for the critical design storm shall not exceed that from the pre-development site from a 100 year ARI storm.

(iii) Water quality (for six or more allotments/titles)

Achieve the following minimum reductions in total pollutant load, compared with that in untreated stormwater run-off, from the developed part of the site:

- total suspended solids by 80%
- total phosphorus by 60%
- total nitrogen by 45%
- litter/gross pollutants by 90%

Consider both continuous simulation and a range of simulated storm modelling techniques to best represent daily water use patterns as they affect available retention, infiltration and/or detention capacities.

6.5.2 The tool shall consider different soil types representative of the Greater Adelaide area. In selecting these soil types consideration shall be given to the Soil Association Map of the Adelaide region and provide for the use of infiltration where appropriate.

6.5.3 The tool shall have the functionality to provide a portable document format (PDF) report summarising all input and export data (assessment results) for submission to Council/relevant authority, to accompany any development application that:

- details whether or not the proposed design solution meets all of the design criteria,

- identifies which, if any, design criteria have not been met by the proposed WSUD solution(s).

6.5.4 Provide check mechanisms in the model to ensure any proposed strategies are assessed from a practically perspective e.g. data entered is checked for being in the correct order of magnitude or numerical range, avoid large storage volumes on small allotments, 10mm detention orifices that are prone to blockage are not permissible etc.

6.5.5 Develop a webpage user interface for the stormwater assessment tool that:

a. is easy to use and makes reference to relevant sections of the guideline document where appropriate, e.g. introductory webpages that describe the policy, i.e. stormwater run-off quality and quantity performance targets,
b. provides a decision support tool in accordance with the framework described in 7.4.1.1
c. provides for minimal data entry on the part of the applicant, e.g. drop down menus as much as practicable to reduce the risk of user error
d. provides a warning system if the entered data is outside of the order of magnitude for the input data range for the variable, for user supplied data
e. provides for site location selection by longitude/latitude, eastings/northings or via selection of location via GIS interface, to then enable the model to select the nearest rainfall gauging station
f. Develop input data tables and output results that provide sufficient information to satisfy Council's development assessment process.

6.5.6 The user manual shall be suitable for Council and consulting engineers, homeowners and builders presented in layman's terms describing the models and methods used in the calculations and any assumptions in the modelling.

6.6 Scope of work

STAGE 1 – COMPARISON OF CURRENT COUNCIL ENGINEERING REQUIREMENTS

6.6.1 Comparison of current Council engineering requirements

a. Compare and contrast the implications of current Council engineering requirements for stormwater management on private land for all Greater Adelaide Councils for three typical development scenarios, as agreed by the client:
   (i) 1 allotment into 2
   (ii) 2 allotments into 5
   (iii) Commercial development of approximately 5,000m^2

   Refer to Appendix 1 Table 1.0 for Detention requirements for a selection of metropolitan Greater Adelaide Councils for small-scale/simple developments.

b. Calculate:
   (i) minimum detention storage volumes and maximum discharge rate required to maintain peak runoff volumes and peak discharge rates at predevelopment levels for the following storm events: Q1, Q5, Q10 and Q20 flows at of tc = 30 mins, 45 mins and 90 mins and 3, 6 and 12 hours. It is noted that the time

concentration (tc) for a domestic site is between 5 – 10 minutes, however this process will enable the implication of catchment characteristics to be considered.

(ii) In lieu of detention, alternative options for minimum retention storage volumes and infiltration systems required to maintain runoff volumes to predevelopment levels for storm events Q1, Q5, Q10 and Q20 flows at predevelopment levels for a range of tc = 30 mins, 45 mins and 90 mins and 3, 6 and 12 hours.

c. Provide a summary and analysis of the results including:

(i) median values for minimum detention storage and maximum discharge rates, minimum retention storage volumes and infiltration system dimensions

(ii) percentage variance from the median for the values in (i) above for each combination of storm event and nominated time of concentration, for each Council.

MILESTONE 1.1 – Review and sign off by Project Management Group

The Project Management Group will review the results with a view to recommending a single set of stormwater detention and retention design criteria that could provide a "best fit" for Greater Metropolitan Councils, to potentially be applied uniformly across the Greater Adelaide metro area and hence enable a simplified stormwater assessment tool.

6.6.2 Consultation

a. Consult with Greater Adelaide Councils regarding
   (i) the report generated for Milestone 1 and
   (ii) the preferred "best fit" stormwater retention and detention requirements for Greater Adelaide, as nominated by the Project Management Group,

b. Undertake a process that aims to reach consensus on the preferred stormwater detention and retention design criteria that can provide the "best fit" for the relevant Councils to be applied in the on-line stormwater assessment tool, including variables such as:
   (i) pre and post development run-off coefficients
   (ii) critical design storm events and durations

c. Seek input from Councils regarding matters including: user interface requirements, checks and balances to ensure practical application of policy refer to Section 5.4 for more information.

d. Provide a brief consultation report and recommendations

MILESTONE 1.2 – Signoff by Project Management Group

STAGE 2 – STORMWATER ASSESSMENT TOOL AND GUIDELINE

6.6.3 Determine a methodology for assessing water quality improvement performance based upon use of the model for urban stormwater improvement conceptualisation (MUSIC) model (or similar continuous simulation model by negotiation).

MILESTONE 2.1 – Signoff by Project Management Group

6.6.4 Develop the draft stormwater assessment tool (ie spreadsheet) to enable development scenarios typical of the nature and scale indicated in Section 4.2.4 to be tested against the WSUD performance measures

MILESTONE 2.2 – Signoff by Project Management Group

6.6.5 Development of a draft guideline document in accordance with the design criteria in Sections 4.2 and 5 of this brief and the model.

MILESTONE 2.3 – Signoff by Project Management Group

6.6.6 Consult with broader stakeholders on the content of the guideline.

6.6.7 Development of a final guideline document in accordance with stakeholder feedback and any Program Management Group input.

MILESTONE 2.4 – Signoff by Project Management Group

STAGE 3 – ONLINE STORMWATER ASSESSMENT TOOL & USER MANUAL

6.6.8 Develop decision support flowcharts for on-line user interface based upon stakeholder consultation.

6.6.9 Develop a draft on-line user interface for the stormwater assessment tool based upon stakeholder consultation

MILESTONE 3.1- – Signoff by Project Management Group

6.6.10 Development of a draft user manual for the on-line tool in accordance with the design criteria in Section 5 of this brief.

6.6.11 Development of a draft operators manual for the on-line tool in accordance with the design criteria in Section 5 of this brief

MILESTONE 3.2- – Signoff by Project Management Group

6.6.12 Consult with broader stakeholders on the:

6.6.12.1 suitability of the draft on-line stormwater assessment tool to meet the brief and their Council circumstances in accordance with the information provided at the consultation phase, including providing targeted stakeholders with access to the development website to test the tool for a minimum of four weeks.

6.6.12.2 content of the user manual.

MILESTONE 3.3 –Signoff by Project Management Group

6.6.13 Develop a final on-line user interface for the stormwater assessment tool based upon stakeholder consultation and the criteria in Sections 4 & 5.

6.6.14 Development of a final user manual in accordance with the design criteria in Section 5 of this brief.

6.6.15 Development of a final operator's manual in accordance with the design criteria in Section 5 of this brief.

MILESTONE 3.4 – Signoff by Project Management Group

6.6.16 Demonstrate to Councils, state government and development industry in a roadshow via a minimum of 3 workshops

6.6.17 Provide the model and tool in a hand-over meeting with the Client that includes training with the operator's manual.

MILESTONE 3.5 – Signoff by Project Management Group

STAGE 4 – Maintain and update the tool

Maintain and update the tool from time to time as required by the client.

STAGE 5 – EXPAND TOOL & GUIDELINE TO SA MURRAY-DARLING BASIN NATURAL RESOURCES AMANGEMENT (NRM) REGION

Amend the tool as necessary for SA Murray-Darling Basin (MDB) Councils (subject to current Integrated Water Management Development Plan Amendment – DPA: Mid Murray Council, Coorong Council, Renmark Paringa Council, District Council Loxton Waikerie, Berri Barmera Council, Karoonda East Murray Council, Southern Mallee Council).

STAGE 6 – EXPAND TOOL & GUIDELINE TO OTHER SA REGIONAL GROWTH AREAS

Amend the tool as necessary for other South Australian regional growth centres, including, but not limited to, Mount Gambier, Port Augusta, Port Pirie, Port Lincoln.

6.7 Deliverables and milestones

Milestone/hold points	Description	Due date
Stage 1	**Comparison of current Council engineering requirements**	
Milestone 1.1	Detention scenario analysis report	15 Nov 2016
Milestone 1.2	Consultation Report regarding support for nominated "best fit" design criteria	16 Dec 2016
Stage 2	**Stormwater assessment tool and Guideline for Greater Adelaide**	
Milestone 2.1	Determine water quality modelling methodology	30 Jan 2016
Milestone 2.2	Stormwater assessment tool	30 Mar 2017
Milestone 2.3	Draft guideline	30 April 2017
Milestone 2.4	Final guideline	15 Jun 2017
Stage 3	**Online interface for Stormwater Assessment tool & user manual**	
Milestone 3.1	Draft on-line user interface for the assessment tool	15 Aug 2017
Milestone 3.2	Draft user manual and draft operator's manual	15 Sep 2017
Milestone 3.3	Consultation summary report	31 Oct 2017

Milestone 3.4	Final online stormwater assessment tool, user manual and operator manual	30 Nov 2017
Milestone 3.5	Roadshow and model and tool handover meeting	12 Dec 2017
Stage 4	Update and maintain the tool as required	Ongoing
Stage 5	Expand tool & guideline to SA Murray-Darling Basin Natural Resources Management (NRM) region (incorporating the balance of SA MDB Councils party to Integrated Water Management DPA (7 Councils)	Subject to funding and the outcomes of previous stages.
Stage 6	Expand tool & guideline to other South Australian regional growth areas	Subject to funding and the outcomes of previous stages.

6.8 Tenders

6.8.1 Content

All Tenders shall include the following information:

6.8.1.1 A detailed description of the project delivery methodology including:

a. a breakdown for each milestone and interim milestones as necessary. In particular details of the proposed method to reach consensus amongst Councils on the preferred design criteria should be provided.
b. a project schedule that identifies expected timelines for client approval of interim milestones.

6.8.1.2 The CVs of all relevant personnel.

6.8.1.3 Details/ examples of similar or related work completed by the proposed project team.

6.8.1.4 If the submission includes a consortium, details of previous project/s that the groups have collaborated on.

6.8.1.5 A cost schedule, indicating costs for each milestone, including personnel contributing to milestone, number of hours of each team member and unit rates, as per the schedule in the RFT Unit rates for any additional works, for example maintenance of the tool.

6.8.1.6 Any assumptions built into the price structure.

6.8.1.7 Any value add in relation to the services.

6.8.1.8 Insurances

Details shall be provided in accordance with the Schedules in the RFT

6.8.2 How to make a submission

Refer to Clause 3.2 of Part B of the RFT.

6.8.3 Enquiries

Any queries during the tender period should be directed to the Client's Nominated Contact Person detailed in Clause 3.3.1 of Section B of the RFT.

6.8.4 Selection criteria

Tenders will be assesses based upon the criteria described in Clause 3.8 of Section B of the RFT.

6.8.5 Contract

A Contract for Services for Stage 1 will be offered to the Preferred Tenderer in the first instance.

If the outcomes of Stage 1

- are compatible with the original scope of works for Stage 2, the successful Tenderer will be offered Stage 2 at the tendered price.
- are such that minor amendments to the original scope of works for Stage 2 are required, the Client will negotiate an amendment to the project scope with the successful Tenderer
- are such that significant amendments to the original scope of works for Stage 2 are required the Client reserves the right to cease the project at the end of Stage 1. At this point an alternate scope of works will be investigated.

Stage 3 will be offered subject to the delivery of Stage 2 to the satisfaction of the Client.

WATER SENSITIVE SA

Appendix 1

Table 1.0 Detention requirements for a selection of metropolitan Greater Adelaide Councils for small-scale/simple developments (to be further expanded)

Council	Residential	Commercial/ Industrial	Reference Document
Adelaide City Council	1 in 20 year ARI (post to pre-development).	1 in 20 year ARI (post to pre-development).	
Adelaide Hills Council	Nil		
Alexandrina Council	TBA		
The Barossa Council	1. Residential development up to 2 dwellings Detention shall be provided to limit the 5yr ARI post–development peak discharge to the 5yr ARI pre-development peak discharge from the site or as required by section 1. (Site Discharge), which ever is the lesser Residential, more than 2 dwellings & land division Detention shall be provided to limit the 20yr ARI post–development peak discharge to the 20yr ARI pre-development peak discharge from the site or as required by section 1. (Site Discharge), which ever is the lesser. The maximum point discharge to kerb and gutter up to a 10 yr ARI event shall be 12 ls^{-1}, 100 yr ARI event shall be 20 ls^{-1}. High risk zones may be subject to additional controls.	Detention shall be provided to limit the 20yr ARI post–development peak discharge to the 20yr ARI pre-development peak discharge from the site or as required by section 1. (Site Discharge), which ever is the lesser.	The Barossa Council Stormwater Management Guide
City of Burnside	TBA		
Campbelltown City Council	TBA		
City of Charles Sturt	Option 1 - Single dwellings/extensions Total proposed roof area[1] (m2) / Detention volume (litres) Up to 50 / Nil	Detain difference in 1 in 100 year ARI for the design storm (determine critical storm duration) for post development to predevelopment	City of Charles Sturt, *#56 Stormwater Management Plan Guide*

	<table><tr><td>up to 200</td><td>2000</td></tr><tr><td>up to 300</td><td>4000</td></tr><tr><td>up to 400</td><td>6000</td></tr><tr><td>Greater than 400 m2 Option 2 applies</td><td>Greater than 400 m2 Option 2 applies</td></tr></table> Note 1 : 90% (min) roof area connected, 20mm (min) diam. orifice Option 2 Less than 3 dwellings – Detain difference in 1 in 5 year ARI for the design storm (determine critical storm duration) for post development to predevelopment All other development - Detain difference in 1 in 100 year ARI for the design storm (determine critical storm duration) for post development to predevelopment		
Town of Gawler	TBA		
City of Holdfast Bay	TBA		
City of Marion	Detain 1 in 100 year ARI event (coeff R/O = 0.45) of predeveloped site to 1 in 5 year ARI event (coeff R/O = 0.25) for post development site	Detain 1 in 100 year ARI event (coeff R/O = 0.85) of predeveloped site to 1 in 5 year ARI event (coeff R/O = 0.65) for post development site	City of Marion *Stormwater Detention Guide, May 2011*
City of Mitcham	Combination of retention and detention required. Refer to *City of Mitcham* *Development Information Rainwater Tanks Fact Sheet*. *Note: Secondary retention* As a target Council advises clients to attempt to get 60% stormwater runoff directed to tanks. The secondary retention component is to encourage stormwater runoff to be directed to landscaping areas, gardens, rain gardens, soakage trenches or similar for normal dwelling developments, however for court yard homes the secondary retention component is to be added to the retention capacity.	Post development flows to the equivalent flow derived from an effective run-off coefficient of 0.25 for a 5 year ARI event, and 0.45 in a 100 year ARI event. In addition for the 5 year ARI event, the peak outflow from the detention system must be checked to ensure the outflow after 90 minutes for the critical storm duration from the detention system is not greater than the flow that would arise from a 90 minute storm based on a predevelopment catchment with a 0.25 runoff coefficient. Should this flow be larger, then the detention volume must be further increased to reduce the outflow to this undetained 0.25 runoff coefficient level. The directly connected time of concentration must be appropriate for the development as described in “Australian Rainfall & Runoff” Volume 1.	*Development Information Rainwater Tanks Fact Sheet*

		A “Limited Out Flow” from the development must be achieved by incorporating into the stormwater drainage design, measures for either On-site Stormwater Retention (OSR) and/or On-Site Stormwater Detention (OSD). The “Limited Out Flow” from the development may be discharged to either Council infrastructure or to an area for On-Site Stormwater Retention (OSR) within the property (landscape area, soakage trench, etc.). Stormwater that is retained on-site (OSR) by utilising landscaped areas within the property, soakage trenches, or additional tank storage, must be contained within the site. Stormwater resulting from a storm, up to and including a 20 year ARI, must not flow or discharge onto land of adjoining owners, lie against any building or create insanitary conditions. Detention tank capacity must be in addition to any proposed rainwater storage tanks for domestic supply or On-site Stormwater Retention. The stormwater design for the development must be certified by a “Charted Professional Engineer” in the field of stormwater management.	
District Council of Mount Barker	TBA		
The Rural City of Murray Bridge NOTE need to ensure accounts for presence of Blanchtown clay.	River Murray Flood Zone – 1 in 100 year detention Regional Town Centre Zone & Residential Zone – 1 in 5 year ARI post development to 1 in 5 year ARI pre-development Rural Living Zone – 1 in 10 year ARI post-development to 1 in 10 year pre-development	1 in 10 year ARI post development to 1 in 10 year pre-development flow; Except for commercial in regional Town Centre Zone – 1 in 20 year ARI post to 1 in 20 year ARI predevelopment; due to max capacity of infrastructure.	
City of Norwood Payneham & St Peters	1 in 5 year ARI (post to pre-development).	1 in 5 year ARI (post to pre-development).	
City of Onkaparinga	Post development flow must not exceed the Pre development flow. 1 in 5 year ARI (post to pre-development).	Post development flow must not exceed the Pre development flow. 1 in 10 year ARI (post to pre-development).	Refer to City of Onkaparinga *Stormwater*

<table>
<tr><td></td><td>Minimum above ground detention capacity for on-site detention (allotment area < 1500m2)
<table><tr><th>Increase in impervious area (m2)</th><th>Detention volume (litres)</th></tr><tr><td>50</td><td>Nil</td></tr><tr><td>100</td><td>3000</td></tr><tr><td>150</td><td>5000</td></tr><tr><td>200</td><td>6000</td></tr><tr><td>250</td><td>8000</td></tr><tr><td>300</td><td>9000</td></tr><tr><td>350</td><td>11000</td></tr><tr><td>400</td><td>12000</td></tr></table>Note 1 : 90% (min) roof area connected, 25mm orifice</td><td></td><td>Management Design Code</td></tr>
<tr><td>City of Playford</td><td>Detain 1 in 5 ARI</td><td>Detain 1 in 10 year ARI</td><td></td></tr>
<tr><td>City of Port Adelaide Enfield</td><td>1 in 5 year ARI (post to pre-development).
Applicant encourage to consider infiltration first
Set Coeff R/O as per stormwater network capacity (SMP/floodplans) or at 0.35 if no data available</td><td></td><td></td></tr>
<tr><td>City of Prospect</td><td>In in 10 year ARI (post to pre-development). Maximum discharge 20 ls^{-1}</td><td>TBC</td><td></td></tr>
<tr><td>City of Salisbury</td><td>1 in 5 ARI
pre-development equivalent</td><td>1 in 10 ARI (</td><td></td></tr>
<tr><td>City of Tea Tree Gully</td><td>See City of Tea Tree Gully Detention Policy</td><td></td><td>City of Tea Tree Gully Detention Policy</td></tr>
<tr><td>City of Unley</td><td>TBA</td><td></td><td></td></tr>
<tr><td>Corporation of the Town of Walkerville</td><td>TBA</td><td></td><td></td></tr>
<tr><td>City of West Torrens</td><td>1 in 20 year ARI Coeff run-off (02–0.25)</td><td>1 in 20 year ARI Coeff run-off (02–0.25)</td><td></td></tr>
</table>

Table 2.0 Other relevant Council policy

Council	Policy
City of Marion	Stormwater management plan (SMP) seeks rainwater tank (retention) storages – propose units: 3,000L and dwellings with roof area under 150m^2: 5,000L, in lieu of meeting detention requirements.

Appendix 2

Extract from South Australian Water Sensitive Urban Design Policy

Extract SA WSUD policy (Water sensitive urban design – Creating more liveable and water sensitive cities in South Australia, DEWNR)

Performance Principle	Performance Principle Intent	State-wide Performance Target	Primary Focus
Water conservation *Water systems are efficient and, where safe and appropriate, sustainable local water resources are given preference over non-local water sources*	Water systems are efficient and water resources are sustainably used	• Demonstrated compliance with South Australian residential building requirements for water efficiency	Residential development
		• Non-residential: evidence demonstrating reasonable effort in promoting water efficient techniques in commercial, industrial and other non-residential urban settings	Commercial, industrial and institutional development
		• Irrigated open spaces: evidence demonstrating reasonable effort in promoting best practice irrigation management in outdoor irrigated open spaces	Irrigated open space areas
Runoff quality *Positively manage the quality of urban runoff through implementing water-sensitive urban design*	To help protect and, where required, enhance, the quality of runoff entering receiving water environments~~,~~ in order to support environmental and other water management objectives.	Achieve the following minimum reductions in total pollutant load, compared with that in untreated stormwater runoff, from the developed part of the site[1]: • Total suspended solids by 80 per cent • Total phosphorus by 60 per cent • Total nitrogen by 45 per cent Litter/gross pollutants by 90 per cent	Residential, commercial, industrial and institutional development, and roads, streets and thoroughfares
Runoff quantity *Post-development hydrology should, as far as practical and appropriate, minimise the hydrological impacts of urban built environments on watercourses and their ecosystems*	• Help protect waterways and, where relevant, promote their restoration by seeking to limit flow from development to pre-development levels. • Help to manage flood risk, by limiting the rate of runoff to downstream areas to appropriate levels.	For waterway protection[2]: • Manage the rate of runoff discharged from the site so that it does not exceed the pre-urban development 1 year average recurrence interval (ARI) peak flow	Residential, commercial, industrial and institutional development, and roads, streets and thoroughfares, where runoff from these land uses drains to an un-lined watercourse
		For flood management: • For development and other relevant infrastructure that will drain runoff to an existing publicly managed drainage system or to a drainage system	Residential, commercial, industrial and institutional development, and roads, streets and thoroughfares

[1] These targets are aimed at diffuse pollution from multiple sources, and do not override obligations for specific sites under the *Environment Protection Act 1993* and the *Environment Protection (Water Quality) Policy 2003.*

[2] The principle relating to the waterway protection target is such that the target would not be deemed relevant where, for example, a watercourse that is to receive the runoff is degraded and it has limited potential for future rehabilitation.

		such as a creek or watercourse on privately-owned land: – the capacity of the existing drainage system is not exceeded; and there is no increase in the 5 year ARI peak flow and no increase in flood risk for the 100 year ARI peak flow, compared to existing conditions	
Integrated design *That the planning, design, and management of WSUD measures seeks to support other relevant State, regional and local objectives*	Implement WSUD in a way that promotes establishment of 'green infrastructure' and achievement of multiple outcomes, for example: public amenity, habitat protection and improvement, reduced energy use and greenhouse emissions, and other outcomes that contribute to the wellbeing of South Australians	Evidence that relevant stakeholders are engaged at appropriate stages of planning, designing, constructing, and managing WSUD measures so as to maximise the potential for WSUD to contribute to 'green infrastructure' and other opportunities relevant State, regional, and local objectives	Residential, commercial, industrial and institutional development and roads, streets and thoroughfares

Appendix 3

References

References of note include, but not be limited to:

Brisbane City Council (2011) WSUD Streetscape planning and design package

EPA Raingarden 500 Guidelines.

City of Mooney Valley, March (2014), Water Sensitive Urban Design Compliance guidelines for new development,

Waitakere City Council, Stormwater Solutions for Residential Sites (Ver1.0)

Tonkin Consulting, January 2013, Draft Stormwater Management Plan, Coastal Catchments between Glenelg and Marino Cities of Holdfast Bay and Marion,