WATER SENSITIVE SA

Business plan
2018-19 to 2020-21

February 2020 update

Authors

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1. Who we are

Water Sensitive SA is a capacity building program that provides stakeholders across all disciplines within the development and urban water management industries, with the support they need to achieve the best water sensitive urban design (WSUD) outcomes.

Developers, planners, urban designers, engineers, landscape architects, scientists, builders and maintenance workers all have roles in the development of our cities and suburbs, and many of them recognise the value of WSUD and incorporate it in new infrastructure projects and developments. Water Sensitive SA provides these professions with access to the latest WSUD information; training on know how to apply it properly; and an opportunity to gain valuable insight from the experiences of other practitioners; guidelines, tools and training to inspire and facilitate the delivery of best practice WSUD.

Every capital works project, infrastructure renewal and new development represents an opportunity for smarter water management that contributes to the creation of a more liveable, water sensitive community. Water Sensitive SA will bring about a cultural shift in which WSUD is widely recognised and embraced.

2. Our vision and objective

Water Sensitive SA will continue to support Adelaide and our regions on their journey to become water sensitive communities that are sustainable and resilient to climate change, and have intergenerational equity, and to aid in the creation of more liveable cities.

Our vision

To create water sensitive communities that are liveable, sustainable, productive and resilient.

Liveable

Sustainable

Source: S.Bryars

Productive

Resilient

Our objective and mission

Our objective is that:

- WSUD is an integral component in urban development and major projects to facilitate the transition of the state's cities and towns to water sensitive communities.
- All relevant government and industry sectors and the community have the commitment, knowledge and skills to work towards this common objective.

Our mission is to provide leadership for government, industry and broader stakeholders through innovation and flexibility in WSUD-relevant policy and design. We will bring about a cultural shift in which WSUD is widely recognised and embraced. We will provide practitioners with guidelines, tools and training to inspire and facilitate the delivery of world-class projects and developments.

Measures of success of 3-year program

The achievement of the following high-level goals will demonstrate that the program has been effective in its engagement of a broad range of stakeholders, which has resulted in cultural and behavioural change:

Development

1. Green infrastructure and WSUD performance-based planning policy is embedded within the *Planning and Design Code, Standards and Guidelines*, agreed for adoption by June 2020, and these policies are effective in achieving desired water quality, flood management, water conservation and urban greening objectives.
2. Proposed MUSIC Guideline for SA embedded within EPA Environment Protection (Water Quality) Policy or similar
3. Development industry support the proposed green infrastructure and WSUD policy direction
4. Online green infrastructure and stormwater assessment tool(s) for small scale development is integrated within the e-planning system by June 2020
5. Developers are participating in a WSUD incentive scheme that represents a model for other local government areas
6. Guide for water sensitive urban design -stormwater management for small-scale development: (i) promoted by planning professionals and (ii) adopted by development applicants
7. A close alliance has been established with the development industry HIA/UDIA such that the benefits of WSUD implementation are well understood and the industry, in collaboration with Water Sensitive SA, is working towards supporting its own members to increase their knowledge and practical application of WSUD.
8. Strong practitioner uptake of proposed MUSIC e-resources

Public Assets

9. WSUD principles and practices are integrated into asset managers management plans and asset renewal programs and capital works programs
10. WSUD asset maintenance programs are suitably resourced.
11. Consistency in the technical rigor and quality of design of WSUD assets

Industry and community capacity

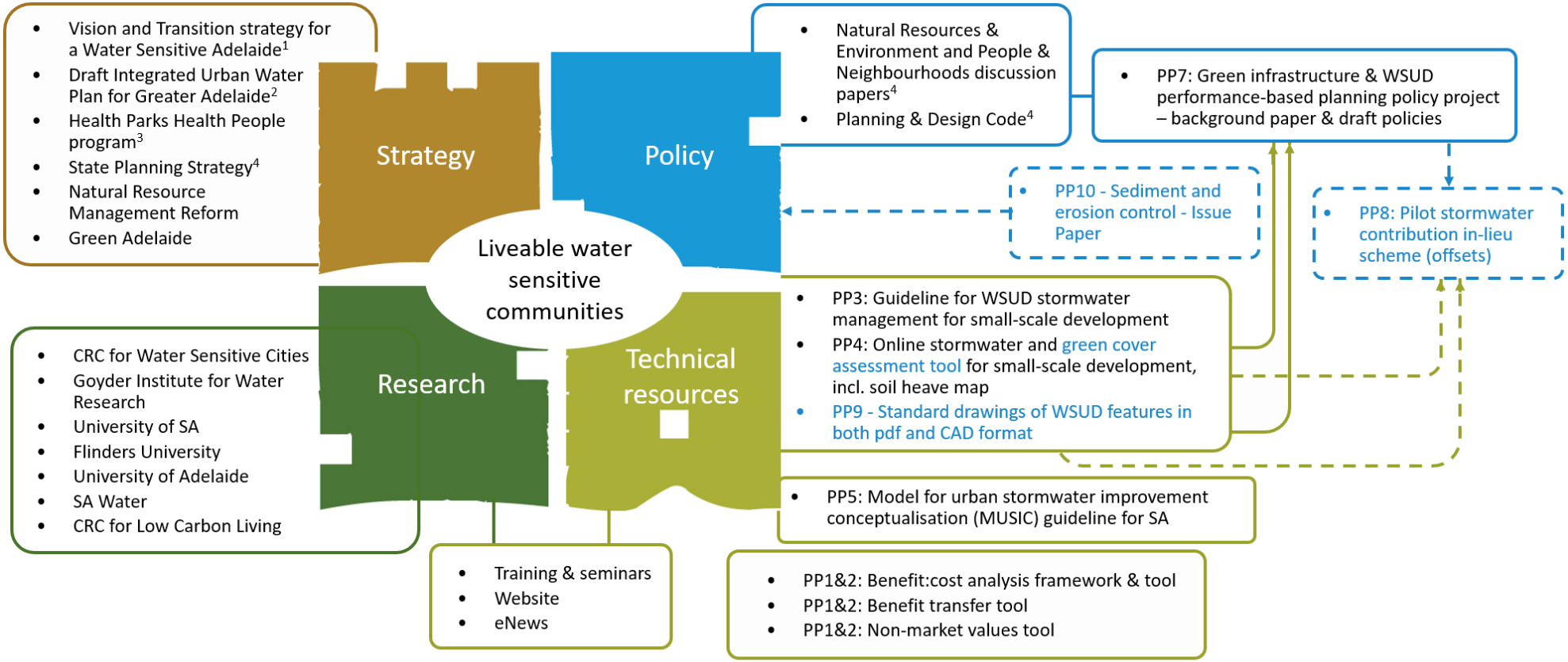
12. 90% of practitioners attending our training, seminars and workshops report an increased capacity to deliver bet practice WSUD
13. The community has greater awareness of how WSUD contributes to liveability and how they can personally adopt WSUD practices in their home and garden.

Governance and economic evaluation

14. The program has a sustainable governance structure that meets the needs of our partners.
15. The program has secured funding from a mix of government (local, state and federal) and industry sources to ensure achievement of our objectives subject to review in 2020-21
16. Application of benefit: cost tools as part of compliance with local government procedures and existing SA Treasury guidelines for the evaluation of public sector initiatives Part B: Investment Evaluation Process with respect to valuing externalities of water related projects

3. Our program

Our program overview



1. CRC for Water Sensitive Cities
2. Department for Environment and Water
3. Department for Health and Wellbeing
4. Department of Planning, Transport and Infrastructure

Yet to be funded

Our program logic

ASPIRATIONAL PROGRAM GOAL

Water sensitive urban design (WSUD) is an integral component of any development or infrastructure project. All relevant government and industry sectors have the commitment, knowledge and skills to meet this common goal.

LONGER-TERM OUTCOMES

- Greater connection between communities and their environment (both local and remote)
- Increased amenity values
- Reduced impact of run-off from stormwater
- Urban watercourse protection with high-quality aquatic and biodiversity outcome
- Protection of aquatic, coastal and marine environments
- Increased demand and supply of alternative, fit-for-purpose water sources
- Productive uses of alternative water sources maximised and contributing to urban greening and food production
- Integrated climate change adaptation using water to green our suburbs and reduce heat island effects
- Reduced flood risk

	ACTIVITIES	PRIORITY PROJECT	OUTPUT	DELIVERY DATE	PARTNERS/AUDIENCE	ELEMENT TO BE ADOPTED	INTERMEDIATE OUTCOMES	INDICATOR OF SUCCESS
Policy development	• Facilitate incorporation of practitioner expertise into agency processes to develop an implementation framework for model green infrastructure and WSUD	PP7 PP10	• *Draft Performance-based planning policy for green infrastructure and WSUD – Background Paper* • *Sediment and erosion control regulation, enforcement and capacity building benchmark SA – Issue Paper*	Completed July 2021	DPTI, Councils, Department of Health and Aging, Australian Institute of Landscape Architecture (SA), Office of Design, Architecture SA / Urban Development Institute (UDIA) of SA, Housing Industry Association (HIA), Master Builders	• *Draft Performance-based planning policy for green infrastructure and WSUD*	• Decision makers and communities understand the multiple benefits of WSUD • Consistency and equity in the application of WSUD and sediment control in new developments and infrastructure projects	• Performance-based planning policy for green infrastructure and WSUD adoption within Planning & Design Code • Development industry support the proposed green infrastructure and WSUD policy direction
	• Advocate for changes in WSUD policy and practice in government, industry and public forums	PP8	• Develop a pilot stormwater contribution in-lieu scheme for a Council(s)	June 2021	Council(s), / (UDIA) of SA, (HIA) and Master Builders.	• Voluntary stormwater offset scheme for off-site versus where applicable	• Flexibility and cost efficiency in how developments meet WSUD performance targets	• Developers are participating in a WSUD incentive scheme that represents a model for other local government areas
Technical resources	• Develop and advocate for Water Sensitive SA resources to support implementation of WUSD policy to be integrated with the new planning system	PP3	• Guide for water sensitive urban design – stormwater management for small-scale development	Completed	DPTI, Councils / Community, developers	• Best practice WSUD techniques for small-scale applications	• Practitioners have the guidelines and tools necessary to inform planning, design, construction and maintenance of WSUD assets	• Guide for water sensitive urban design -stormwater management for small-scale development: (i) promoted by planning professionals and (ii) adopted by development applicants
		PP4 PP4a PP4b	• Online stormwater assessment tool for small-scale development – Pilot • Soil movement map – raster map developed from compiled industry data • Green infrastructure assessment tool for small-scale development	June 2020 July 2020 June 2021	Councils, DPTI, LGA Geotech industry, DEW, DPTI, Councils / Community, developers Councils, LGA	• Insite Water stormwater assessment tool • Direct link from online tool to soil movement map • Online stormwater tool used as basis for green space tool	• Development applicants can better consider rainwater harvesting, site permeability and infiltration at the planning approval phase • Net gain/loss of green cover can be readily measured at application stage	• Insite Water tool promoted by Councils to development applicants • Industry endorsement of quality of soil movement raster map • Online green infrastructure assessment tool for small scale development integrated within the proposed e-planning system
		PP5	• MUSIC Guideline for South Australia • Electronic tools to support design and assessment	July 2020 June 2020	EPA, SMA/ Consulting industry, Local government EPA,SMA / Consulting industry, Local government	• MUSIC input tables calibrated for specific SA zones • MUSIC input files calibrated for specific SA zones and assessment auditor tool available online	• Greater consistency in rigor in application of MUSIC • Greater efficiency in the application of MUSIC	• MUSIC Guideline for SA embedded within EPA Environment Protection (Water Quality) Policy or similar • Practitioner uptake of MUSIC e-resources
		PP9	• Standard drawings of WSUD features in both PDF and CAD format	June 2021	Councils, IPWEA / Consulting industry, Local government	• Pdf and CAD files of standard drawings of WSUD elements available online	• Improved quality of designs incorporating WSUD elements, and associated cost savings to client	• Consistency in the technical rigor and quality of design of WSUD assets
	• Review and update existing technical guidelines for WSUD in SA	PP6	• WSUD technical guidelines customised for the target audience	June 2021	National WSUD capacity building programs / Consulting industry, Local government	• Best practice WSUD techniques for all scales	• Improved quality in planning, design, construction and maintenance of WSUD elements and associated cost savings	• National capacity building program agree to share intellectual property in existing guidelines
	• Develop case studies to demonstrate WSUD application at a range of scales	Core Business	• 3 x case studies per annum. • WSUD projects Interactive map - updated regularly	Ongoing	Councils, consulting industry	• Best practice WSUD techniques for all scales	• Demonstration of WSUD practices providing increased practitioner trust in the benefits and application of WSUD	

	ACTIVITIES	PRIORITY PROJECT	OUTPUT	DELIVERY DATE	PARTNERS/AUDIENCE	ELEMENT TO BE ADOPTED	INTERMEDIATE OUTCOMES	INDICATOR OF SUCCESS
Communications	• Share latest research and practice via e-newsletters, Youtube videos, blogs and online forums. • Deliver "Water for liveability" campaign to raise practitioner and community awareness of the benefits of WSUD and how it can be applied	Core business	• 6 x e-newsletters per annum • YouTube videos of selected seminars/training	Ongoing	CRCWSC, Goyder Institute, University of SA, Adelaide University, Councils / practitioners and community	• Best practice WSUD techniques for all scales	• Practitioners and the broader community are informed of techniques to apply WSUD over a range of scales	• Online green infrastructure and stormwater assessment tool(s) for small scale development is integrated with the e-planning system
Training	• Provide training regarding WSUD planning, detailed design, construction, operation and maintenance including: Detailed design of biofilters, WSUD 101 for planners and development assessors, construction and maintenance of vegetated stormwater management systems	Core business	• 3 x full day training courses per annum	Ongoing	CRCWSC, Goyder Institute, University of SA, Adelaide University, Councils / practitioners and community	• Applied learnings from training	• Practitioners efficiently deliver best practice integrated water management and WSUD technologies, with reduced financial risk	• 90% of attendees at our training, seminars and workshops report an increased capacity to deliver bet practice WSUD
Institutional capacity	• Provide forums for practitioners across government and industry to network and discuss WSUD policy, technical, political and socio-economic matters and implementation challenges (establishing a community of practice)	Core business	• 4 x seminars per annum	Ongoing	Councils, DEW, DPTI, Office of Design and Architecture SA, Department of Health and Aging	• Applied learnings from seminars	• Increased ability of various agencies and industry sectors to collaborate on projects and discuss and debate the technical, political and socio-economic issues associated with mainstream uptake of WSUD • Practitioners efficiently deliver best practice integrated water management and WSUD technologies, with reduced financial risk	• 90% of practitioners attending our training, seminars and workshops report an increased capacity to deliver bet practice WSUD
Protection our investment	• Develop reference materials to document the capital, operational and maintenance costs associated with WSUD to inform budgeting processes of developers and Councils for capital works, operations, maintenance and asset renewal	PP2	• Fact sheet of whole-of-lifecycle costs for a range of WSUD assets for retrofit and greenfield scenarios, together with suitable maintenance regimes and costs for a range of WSUD assets	June 2021	Councils	• WSUD asset maintenance regimes and associated budgets	• The whole-of-life costs of WSUD assets are understood	• WSUD principles and practices are integrated into: (i)asset managers management plans and asset renewal programs and (ii)capital works programs • WSUD asset maintenance programs are suitably resourced. • Consistency in the technical rigor and quality of design of WSUD asset
Research	• Work with researchers such as Goyder Institute, CRC for Water Sensitive Cities and CSIRO to provide research outcomes of relevance to the practitioner base in an accessible form • Inform future research where appropriate	PP1	• BCA framework and tool and Benefit transfer tool for non-market values • Salisbury East Rejuvenation- water sensitive outcomes for an infill precinct – BCA case study • Work with researchers and/or citizen science programs to monitor the performance of WSUD assets	Completed 2020 June 2021	CRCWSC / practitioners, treasury Councils and agencies / development industry University of SA, University of Adelaide, community	• Framework for BCA for water related projects • Evidence base for a water sensitive infill precinct • Evidence base for a water sensitive infill precinct	• Accessible research increases practitioner trust in the benefits and application of WSUD • Asset managers/designers demonstrating greater willingness to adopt WSUD practices	• Application of tools as part of compliance with existing SA Treasury guidelines for the evaluation of public sector initiatives Part B: Investment Evaluation Process with respect to valuing externalities • Great number of asset managers and designers adopting WSUD principles and practices into asset renewal programs

Figure 3.1 Water Sensitive SA program outcomes and activities

What we offer

The Water Sensitive SA program has been developed under a logical framework drawing upon the outcomes of extensive consultation undertaken with practitioners throughout the development of the business case (Alluvium 2012), the program establishment project (Designflow 2014) and more recently with the appointment of the program manager.

Enabling factors to support the transition to a water sensitive community described by Brown (2007) including: Socio-political capital; champions; accountability; trusted and reliable science; market receptivity; bridging organisations; and binding targets have also guided program development. Our core business deliverables are detailed in Table 7.1.

As the hub for WSUD activity and learning in South Australia, Water Sensitive SA provides:

- WSUD policy development and implementation pathways
- networking opportunities and peer-to-peer learning on strategic, policy and technical matters
- specialist training to address key knowledge and skills gaps
- more accessible WSUD research for practitioners
- resource development, including guidelines and tools
- information sharing through our website, e-newsletter, blog articles and forums.

Training and community of practice

Building the knowledge and skills base of South Australian WSUD practitioners is one of the primary objectives of Water Sensitive SA. Implementation of the training program and seminar series shown in Table 3.1 aims to develop a common understanding of the challenges and solutions associated with the planning, design, construction and maintenance of WSUD elements. This will provide a more consistent approach to WSUD and support the industry performance against best practice standards.

The seminar and workshop series will provide an opportunity for access to latest research and peer–to-peer learning of WSUD practice that has worked well and the challenges and learnings along the way to establish a community of practice for SA.

Table 3.1 2019-20 indicative training and seminar series schedule

Date		Training/ Seminar	Topic
December	2019	Seminar & Workshop	CRCWSC Built form typologies catalogue for urban infill development – providing for greener suburbs and water sensitive outcomes
February	2020	Seminars & workshops	Cooler, greener Adelaide – Road testing the new planning policies (4 x community events)
March	2020	Training	Design, construction and maintenance of green roofs and walls (V)
April	2020	Training	Green infrastructure and water sensitive urban design: Compliance with the draft Planning & Design Code, for the Planning Institute of Australia (SA Chapter)
May	2020	Seminar	National passive infiltration guidelines: interpretation and application
June	2020	Seminar	Assessment of stormwater plans using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Guidelines for SA (V)

(V) denotes event will be recorded on video and placed on Water Sensitive SA YouTube channel, subject to available funds
Note: Indicative program – may be subject to change dependent upon service provider availability and demand.

4. Priorities for 2018-19 to 2020-21

In April 2018, a strategic planning workshop was held with our investment partners and prospective partners to review the achievements of the program since its inception in November 2014 and identify priorities for the current three-year business plan. The Water Sensitive SA program for 2018-19 to 2020-21 incorporates the outcomes of this workshop along with feedback provided in a subsequent online survey. During 2019-20, the second year of this three-year business plan, activities will focus on supporting practitioners to understand and adopt the series of guidelines, tools and other resources completed in 2018-19, including:

- *Perspectives on performance-based planning provisions and assessment frameworks for green infrastructure and WSUD*, Priority Project 7 (PP7) (PDF)
- Green infrastructure and water sensitive urban design planning policy opportunities summary booklet (PP7)
- Stormwater assessment tool for small-scale development (PP4):
  - Insite Water online stormwater assessment tool
- A suite of resources for delivering WSUD in small-scale developments (PP3 &4)
  - WSUD 01: A guide for water sensitive urban design: Stormwater management for small-scale development (PDF)
  - WSUD 02: Residential development – deemed-to-satisfy solutions for stormwater management (PDF)
  - WSUD 03: Residential development – compliance with the InSite Water Tool (PDF)
  - WSUD 04: Commercial development – compliance with the InSite Water Tool (PDF)
  - WSUD 05: Technical drawings of standard WSUD treatments for small-scale development (PDF)
  - WSUD 06: InSite Water Tool User Manual (PDF)
  - WUSD 07: InSite Water Tool Engineering Methods (PDF)
  - WSUD 08: FAQs
- CRC for Water Sensitive Cities Benefit: cost analysis tool for green infrastructure and water related projects (PP1&2) and Non-market values and benefit transfer Tool

The key outputs proposed for the next two years are described below.

4.1. Part A – Core business

4.1.1. Stakeholder engagement

Water Sensitive SA will continue to present at a variety of cross-disciplinary industry forums to raise awareness of opportunities to integrate WSUD into practice across a range of scales and provide the evidence base for such a change. This core function is critical to maintaining the momentum for change in the way our cities and communities grow and renew.

Focus for the current business planning period will be on:

Development industry

During 2018-19, the *Green infrastructure and WSUD performance-based policy* project (Priority Project 7) produced model development plan policy for potential inclusion in the Planning and Design Code. Water Sensitive SA, in collaboration with our partners, will engage with the development and building industries to gain an understanding of their views on the application of this policy and their associated capacity building needs. Consultation will include discussion on the nature and scope of potential voluntary offset schemes in lieu of on-site solutions.

4.1.2. Research adoption pathways

Goyder Institute for Water Research

The first three years of the Goyder Institute for Water Research (Goyder Institute) research program had a strong emphasis on urban water management, in particular WSUD, to inform emerging state government policy. The associated technical report series continues to be an important resource for Water Sensitive SA's activities and priority projects. The application of the most recent research from the Goyder Institute (Myers, B, Cook, S, Pezzaniti, D, Kemp, D, Newland, P (2015), *Implementing water sensitive urban design in stormwater management plans* Technical Report Series No. 16/7, Adelaide, South Australia) has informed Priority Project 5, *MUSIC Guidelines for SA,* as described in Section 4.2. A peer review of Section 4 Assessing Water Quality Improvement: MUSIC Modelling Recommendations for South Australia (pp 53-95) of the Myers et. al. report was undertaken in June 2019 as part of PP5.

Cooperative Research Centre for Water Sensitive Cities

The CRC for Water Sensitive Cities has invested in research adoption pathways in South Australia. This will expand South Australia's research translation capability and provide sufficient resources to ensure South Australian needs are embedded in the next three years of this national research program, referred to as Tranche 2 Integrated Research Projects (IRPs).

CRCWSC Tranche 2 projects are:

IRP1 – Preparing a Water Sensitive Cities (WSC) transition plan for Adelaide. The *Vision and transition strategy for a water sensitive Adelaide* (WSC Transition Plan) was launched in February 2018. Water Sensitive SA will continue to support this project by communicating outcomes to WSUD practitioners, and provide forums for decision makers and practitioners across the urban water management industry to further the objectives of the WSC Transition Plan.

IRP2 – Benefit-cost analysis framework and tool for WSUD and green infrastructure. This is a Water Sensitive SA priority project. See more detail below in Section 4.2, Box 3.

IRP3 – Evidence based integrated urban planning across different scales. IRP3 aims to provide targeted guidance to multiple case study regions on how to effectively advance their city shaping, water sensitive practices by applying a framework for integrated urban and water planning. IRP3 project will develop this framework and supporting processes, software and guidelines through a number of industry case studies." (CRC WSC)

IRP4 – Achieving water sensitive outcomes for infill development. This project has investigated solutions from an allotment to precinct scale, considering mass water and energy balances and whole of lifecycle costs of a range of WSUD solutions. Salisbury East is the subject of a South Australian case study for IRP4. A Typologies Catalogue providing design guidance for the built form for infill developments, building upon research from Tranche 1 of CRCWSC, is in the final stages of development. The Program Manager chairs the industry partner steering committee for this project.

Tools and products. The CRCWSC had developed a range of tools to help practitioners to apply research outputs, including:

- Water Sensitive Cities Transition Platform (TAP1) – completed
- Water Sensitive Cities Scenario Platform (TAP2) – partially complete, for example the Water Sensitive Cities microclimate model that demonstrates the urban cooling benefits of a range of WSUD solutions via simple manipulation of land cover status of satellite imagery.
- Water Sensitive Cities Design Platform (TAP3) – under development

We will work with the CRCWSC to raise awareness of these tools and products amongst practitioners and facilitate training where demand exists.

4.1.3. Technical resources

Demonstration of best practice WSUD
Water Sensitive SA has developed a number of case studies describing WSUD projects in the public realm over a range of scales. There is growing demand for information on how to apply WSUD in private developments. We will work with the development industry over the coming three years to add further case study resources and sites to our WSUD projects interactive map and image gallery.

We will continue to expand our suite of additional technical resources including fact sheets, videos of seminars uploaded to our YouTube channel, videos of the month of best practice exemplar projects and more infographics to demonstrate the benefits of WSUD.

4.1.4. Training and community of practice

Practitioners
Water Sensitive SA will continue to offer technical training and our seminar series to provide opportunities for peer-to-peer learning (including site visits), and research translation. Priority topics for this financial year will be construction of WSUD assets, WSUD for planners and development assessment engineers, and design of green roofs and walls.

Our indicative training and events program for practitioners for 2019-20 is provided in Table 3.1

Community – WSUD in your home and backyard
Our course, *WSUD in your home and backyard,* has been delivered at 21 community workshops, in conjunction with the Natural Resources Adelaide and Mount Lofty Ranges (NR AMLR) Urban Engagement team as part of the *Living Smart* community sustainability program and other Council initiatives at: the City of Charles Sturt, City of Mitcham, City of Onkaparinga, City of Marion, City of Unley, City of Port Adelaide & Enfield, City of Tea Tree Gully, Adelaide Hills Council, and City of Holdfast Bay. In several Councils the course has been delivered multiple times throughout their district. This course is available to our local government partners and others upon request. The course material has been adapted as a web-based resource on our Community webpage – Smart water solutions for your home and backyard.

4.1.5. Communications

The program review identified that SA WSUD practitioners prefer to receive information regarding technical resources and news on best practice WSUD via our e-newsletter and links to our website. We will continue to provide latest resources and news to our subscribers through our e-newsletter and website.

To maximise the reach of the program, video recordings of selected Water Sensitive SA seminars will feature on our YouTube channel.

Subject to additional funding, a suite of WSUD “how to” and project “showcase” videos will be developed to demonstrate best practice WSUD to a broad audience.

Opportunities to enhance our social media profile will be investigated to communicate key messages and promote exemplar WSUD projects and events. In addition, Water Sensitive SA will engage in relevant community conversations/debate in the media (print, television, electronic-social) to demonstrate the benefits of a WSUD approach to how we develop our cities and towns.

Building upon the success of the WSUD in your home and backyard training and the Cooler Greener Adelaide forum and exhibition held in March 2019, the Water Sensitive SA Community webpages have been updated to provide a hub for the community to keep abreast of government policies and strategies that enhance or may affect urban greening and WSUD – Cooler, greener Adelaide | Updates.

Associated discussion in the public domain on urban greening and WSUD has attracted media interest to Water Sensitive SA events and programs.

4.2. Part B – Priority projects

Box 1 – WSUD policy adoption

The issue of greatest need for action that emerged from the program's three-year review in March 2017 and the Water Sensitive SA partners strategic planning workshop April 2018, is to continue efforts to embed WSUD policy within the planning system. Introduction of the SA WSUD policy principles and targets into the proposed Planning and Design Code would complement the intended shift to a performance-based policy approach within planning policy.

PP7 Green infrastructure and WSUD performance-based planning policy – Water Sensitive SA, in collaboration with the Department of Environment and Water (DEW) and Department of Planning, Transport and Infrastructure (DPTI) (Planning), has developed the *Perspectives on performance-based planning provisions and assessment frameworks for green infrastructure and WSUD* (GI and WSUD policy review report).

The core deliverables of this project are:

1. High level objectives and principles to inform tools under the *Planning, Development and Infrastructure Act 2016* (the PDI Act) that facilitate, or could potentially facilitate, green infrastructure and WSUD.
2. A suite of performance-based planning provisions for green infrastructure and WSUD to inform the drafting of the Code, Standards and Guidelines, particularly in the context of the Code-assessed development pathway.
3. A framework to enable an assessment of green infrastructure and WSUD elements of a development against the performance criteria.

Recommendations with the GI and WSUD policy review report include:

Green infrastructure:

G1. Establish minimum required areas of uncovered deep soil zones to be provided for different sized developments to provide sufficient space for tree canopy targets in The 30 Year Plan for Greater Adelaide to be met.
G2. Definitions for deep soil zones and tree protection zones be included in relevant planning documents.
G3. Ensure consistent requirement to provide adequate landscape plans.
G4. Establish a green cover score system and assessment tool.
G5. Establish a trading scheme for offsite green cover solutions for situations where streetscape solutions are deemed by the local Council to provide the greatest community benefit.
G6. In lieu of recommendation 4, develop an index that integrates green infrastructure, tree canopy and WSUD, and prioritises solutions that achieve all three.
G7. Develop guidance material to encourage the use and placement of green infrastructure to disconnect impervious areas from waterways and regional drainage systems (i.e. guidance material to encourage multi-functional green infrastructure).
G8. Investigate new criteria for rate of open space provision for medium and high-density developments.
G9. Investigate options for incentive-based planning policy which facilitates desirable development outcomes for proponents (i.e. additional building levels, higher density outcomes, new built form typologies, a trade-off of private open space for larger areas of communal open space for example) where mature trees, which may not be otherwise protected, are retained and integrated into a development proposal.
G10. Develop a new definition to protect existing trees with a trunk circumference less than that of significant or regulated trees.

Water sensitive urban design

W1. Provide easily assessable WSUD criteria (in the form of new 'deemed to satisfy' criteria) for all developments that focus on water conservation, stormwater quality improvements and peak flow management
W2. Promote landscape integration of WSUD, stormwater volume reduction from developments and combining WSUD and green infrastructure measures for multiple benefits

W3. Provide a 'Deemed to Satisfy' solution for small developments (<2,500m2 for residential and <5,000m2 for non-residential) that addresses the identified performance measures for stormwater quality, water conservation, and flooding.

W4. Develop an on-line WSUD/stormwater tool that enables quick and easy inputs and assessment for small-scale development. Note: Water Sensitive SA has developed the Insite Water tool for development applicants

W5. Monitoring and compliance through site-based assessments by compliance officers

The DPTI Planning and Design Code (P&D Code) is due for completion by June 2020. Water Sensitive SA will continue to work with DPTI and industry to advocate for and support the inclusion of the green infrastructure and WSUD performance-based policy in the P&D Code.

[1] Department of Planning, Transport and Infrastructure, 2016, The Draft 30-Year Plan for Greater Adelaide 2016 Update

[2] Department of Environment, Water and Natural Resources, Water sensitive urban design Creating more liveable and water sensitive cities in South Australia

Box 2 – WSUD integrated in new developments

Implementation tools and guidelines

PP3 –WSUD Guideline for small-scale development. The majority (approximately 90%) of small-scale infill development consists of additions, single dwellings, and one allotment divided into two or three. Water Sensitive SA has released *WSUD 01: A guide for water sensitive urban design: Stormwater management for small-scale development* that provides a range of WSUD solutions for other categories of small-scale infill development including townhouses, apartments and commercial/ industrial developments. The guideline is supported by *WSUD 02: Residential development – deemed-to-satisfy solutions for stormwater management.* A key focus of Water Sensitive SA activities will be to raise awareness of the guideline amongst the planning industry and to train practitioners in its application to ensure WSUD is integrated into new small-scale developments wherever possible.

PP4 – Online stormwater assessment tool for small-scale development. The Water Sensitive SA *Online tool for stormwater management for small-scale development* beta testing has been completed. During 2019-20 Water Sensitive SA will seek partners to establish pilot programs with metropolitan Councils offering the tool for use by development applicants. The tool is supported by a user manual and the draft *Guide for water sensitive urban design – stormwater management for small-scale development* that demonstrates scenarios that comply with the tool. Water Sensitive SA will continue to work closely with DPTI to establish links within the proposed e-planning system to the tool, to support the efficient assessment of stormwater management solutions as part of any small-scale development application.

PP5 – MUSIC Guidelines for SA. In March 2019, a project commenced to prepare the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) guidelines for South Australia. Outputs to date include a peer review of Part IV Assessing Water Quality Improvement: MUSIC Modelling Recommendations for South Australia (pp. 53-95) of the Goyder Institute report, *Implementing water sensitive urban design in stormwater management plans.* The peer review offers guidance on stormwater quality and quantity modelling for SA conditions including appropriate climate data, soil parameters, run-off pollution generation data and routing parameters.

PP8 – Pilot Stormwater contribution in-lieu scheme for a Council(s) – Under the planning reform the PDI Act A provides for offset schemes to be created for situations when a developer is unable to meet policy objectives on-site, e.g. parking requirements. The nature of small-scale infill is such that in some situations it may be more viable to manage stormwater runoff quality and/or quantity in an offsite system.

In late 2017, Water Sensitive SA hosted a seminar and workshop to investigate Alternative funding options for stormwater management, in response to Local Government's need for a sustainable funding mechanism for stormwater infrastructure. The experiences of City of Onkaparinga, City of Kingston

(Victoria) and the pending City of Mooney Valley stormwater management in-lieu schemes offer models for alternative funding schemes for offsite stormwater management solution. Water Sensitive SA seeks to establish a South Australian pilot stormwater management in-lieu scheme to test the viability of broader roll out of such a scheme for South Australian Councils. Water Sensitive SA will seek grant funds and additional stakeholder partnerships and investment to deliver this project.

PP9 – Standard drawings in PDF and CAD of standard WSUD features – To ensure investment in WSUD assets delivers the expected benefits to the environment and the community, it is vital that each project is grounded in best practice design. While Water Sensitive SA offers training to WSUD designers, design resources are needed to support the industry. Water Sensitive SA proposes to develop a suite of standard drawings if PDF and CAD format that can be used as a typical standard drawing, if applicable, or adapted to suit design requirements and site constraints. Brisbane City Council has such a suite of standard WSUD assets drawings for a range of applications.

PP10 – Sediment and erosion control Issue Paper
Earthworks and soil disturbance during the construction process present a significant risk to water quality of urban streams and the marine environment. There is concern that South Australian sediment and erosion control practice falls well short of interstate performance. It is unclear if inadequate delivery of sediment and erosion control measures is due to deficient regulation, enforcement or industry capacity. The proposed issue paper will benchmark South Australia against other Australian states and make recommendations on the opportunities to bring about sediment and erosion control policy and practice needed to adequately protect our natural environment.

Box 3 – Benefit: cost analysis

PP1 – Benefit: cost analysis framework and tool for WSUD and green infrastructure has been delivered in partnership with the CRCWSC national research project IRP2. Water Sensitive SA in conjunction with Adelaide and Mount Lofty Ranges NRM Board and DEW, have collaborated with the CRC WSC to deliver a benefit: cost analysis tool. This project will deliver upon the requirements of Water Sensitive SA Priority Projects 1 and 2, and the Program Manager is a member of the industry partner project steering committee.

The project includes a suite of case studies from the sub-catchment to precinct scale for Australian capital cities to monetise the benefits of urban cooling via WSUD and green infrastructure. A South Australian case study that centres on valuing the benefits of a water sensitive infill suburb using the Salisbury East precinct has commenced and will investigate (i) the ability of greater guidance by Council for applicants at the development application phase to influence better quality urban infill; and (ii) the communities willingness to pay for access to private greenspace, and public greenspace and/or WSUD features.

PP2 – Lifecycle cost analysis. The benefit: cost analysis framework and tool will incorporate whole-of-lifecycle costs of WSUD projects. In addition, a brief fact sheet detailing whole-of-lifecycle costs for a range of WSUD assets will be developed as a guide for practitioners. This fact sheet will build upon existing work by Melbourne Water and the Cities of Marion and Holdfast Bay to develop a guide to understanding capital costs for the construction of WSUD assets for greenfield, retrofit and asset renewal scenarios, together with suitable maintenance regimes and costs for a range of WSUD assets.

Box 4 – Asset management

Asset renewal within Councils and state government authorities typically adopts a “like for like” approach to asset replacement to deliver the nominated level of service. Asset replacement, however, provides an opportunity to efficiently integrate WSUD elements into the urban form. In 2016, the City of Adelaide endorsed “like for green” principles as part of their asset renewal strategy to facilitate the uptake of green infrastructure and WSUD.

The management of WSUD assets, in a condition that ensures they function in accordance with their design intent, has been a barrier to the widespread uptake of these systems. Water Sensitive SA

Maintenance of WSUD assets full-day course supports practitioners to gain a better understanding of asset condition auditing requirements, associated maintenance activities and costs.

South Australian Councils will update their asset management plans after the next Local Government elections in November 2018. To date, several Councils have adopted the asset management plan template produced by the Institute of Public Works Engineers Australasia (IPWEA) to align with ISO 55001. This process offers an opportunity to review how WSUD assets are represented within asset management plans at present and strengthen details of maintenance regimes, asset lifetimes, renewal costs and other lifecycle costs. Water Sensitive SA will work with the SA Asset Managers Group, IPWEA, Councils and others to support this integration.

5. The people behind the program

Governance

Water Sensitive SA program development and implementation is overseen by a steering committee consisting of eight leaders in the fields of engineering, planning, landscape design and research. This committee is responsible for setting the program's strategic direction and acting as its ambassadors. Several members of the steering committee were appointed for a second term in April 2018 and were joined by two new members as listed below:

- Keith Downard (chair)
- Dr Peter Dillon
- Dr Sheryn Pitman
- Greg Ingleton
- Joe La Spina
- Andrew King
- Dr Michele Ackeroyd
- Dr Robin Allison

Program management for Water Sensitive SA is currently being delivered under a service contract with the Adelaide and Mount Lofty Ranges Natural Resources Management (AMLR NRM) Board, managed by the Department of Environment, Water and Natural Resources (DEWNR), on behalf of the program partners.

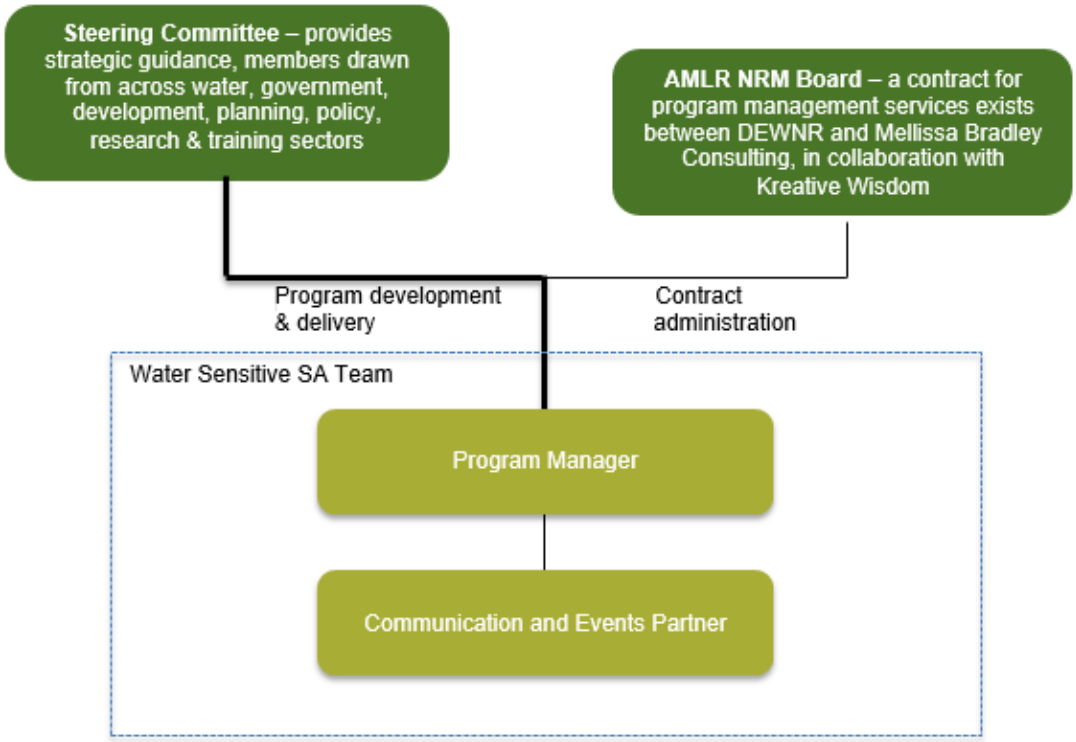


Figure 5.1 Water Sensitive SA Governance structure

Project delivery team

On behalf of the project partners, the Program Manager (Mellissa Bradley) and Communication and Events Partner (Kathryn Bothe) are responsible for the delivery of the program under a service contract with the AMLR NRM Board.

Governance

A governance workshop was held in June 2019 to investigate a variety of potential future delivery models for the Water Sensitive SA program. There is a strong preference to retain the independent advisory function via the steering committee with strong linkages with the Department of Environment and Water given the priority of WSUD in state government strategies. Models that include continued external service delivery through DEW on behalf of the partners or an internal DEW program were preferred over

establishment of an incorporated body, establishment of an umbrella not-for-profit company or seeking an alternative host.

Project partners

The investment partners are: AMLR NRM Board, Australian Government National Landcare Programme, City of Adelaide, City of Burnside, City of Charles Sturt, City of Marion, City of Mitcham, City of Onkaparinga, City of Playford, City of Port Adelaide Enfield, City of Prospect, City of Salisbury, City of Tea Tree Gully, City of Unley, CRC for Water Sensitive Cities, EPA South Australia, Local Government Association of South Australia, Local Government Research and Development Scheme, Rural City of Murray Bridge, SA Water and Stormwater SA.

In addition, significant investment support has been provided for our priority projects by City of West Torrens, Department of Environment and Water and Stormwater Management Authority.

The University of South Australia provides valuable in-kind support to the program, providing the evidence base for many of our activities.

Figure 5.2 Program investment partners

6. Budget estimates

6.1. Income

The budget estimates provided in Table 6.1 are based upon current level of investment from Water Sensitive SA partners and prospective partners and is subject to the execution of formal grant agreements between the AMLR NRM Board and the relevant partners.

2019-20 income estimates summary

Table 6.1 Projected income from partners annually

	Income (as per grant agreement) per financial year (+ GST)		
Funding partner	2018-19 deficit	2019-20	Total
Carry over (deficit)[3]	-$3,942		
Adelaide and Mount Lofty Ranges NRM Board		100,000	
City of Burnside		5,000	
City of Campbelltown[1]			
City of Charles Sturt		5,000	
City of Holdfast Bay[1]			
Corporation of the City of Marion		5,000	
City of Mitcham		7,500	
City of Mount Gambier[1]			
City of Norwood, Payneham St Peters[1]			
City of Onkaparinga		10,000	
City of Playford		5,000	
City of Port Adelaide Enfield		5,000	
City of Prospect		3,000	
City of Salisbury		10,000	
City of Tea Tree Gully		5,000	
Corporation of the City of Unley		3,000	
Corporation of the Town of Walkerville		3,000	
SA Water		5,000	
Rural City of Murray Bridge[1]			
Stormwater Management Authority		20,000	
EPA		12,500	
Total	**-$3,942**	**$204,000**	**$200,058**

Note 1: Prospective new / renewing partners

Note 2: All income nominated above is subject to the execution of grant agreements between the partner organisations and the AMLR NRM Board.

Note 3: Deficit carried by Adelaide and Mt Lofty Ranges NRM Board, due to grant funds from Stormwater Management Authority ($20,000) and EPA $12,500 will now to be received in 2019-20 financial year

6.2. Expenditure

Budget estimates have been prepared based upon the current level of investment from existing partners as detailed below in Table 6.2, with total expenditure for 2019-20 expected to be approximately $200,000.

2018-19 to 2020-21 budget estimates

Table 6.2 Program budget estimates

Deliverable	Expenditure (+ GST)			
	Actual	Forecast		
	2018-19 $	2019-20 $	2020-21[1] $	Total $
Part A: Core business				
Program management	19,808.25	19,000	20,000	58,808
Stakeholder engagement	9,570.00	8,000	8,000	25,570
Research and adoption pathways	8,108.55	6,500	8,000	22,609
Technical resources development	17,150.00	25,000	27,000	69,150
Training and community of practice	41,927.10	30,000	30,000	101,927
Communications	25,013.35	16,000	17,000	58,013
Sub-total 1	$121,577.24	$104,500	**$110,000**	$336,077
Part B: Priority Projects		5,500		5,500
1. Case for WSUD – cost benefits analysis	7,280.00	5,500	10,000	22,780
2. Lifecycle cost analysis	-	-	12,000	12,000
3. Deemed to comply guideline – urban design code	2,386.07	2,000	-	4,386
4. Online tool for simple/small-scale developments	25,970.00	27,000	18,000	70,970
4a. Soil movement map – metro. Adelaide raster map developed from compiled industry data	4,750.00	8,000	-	12,750
4b. Green infrastructure assessment tool for small-scale development (adapt Insite Water)			25,000	25,000
5. MUSIC (stormwater quality model) Guidelines for SA and e-tool	18,568.11	35,000	12,000	65,568
6. Technical guidelines review and update/adapt – SA and interstate	100.00	-	-	100
7. Green Infrastructure and WSUD performance-based planning policy – engagement and adoption	23,310.50	16,500	10,000	49,811
8. Develop a pilot stormwater contribution in-lieu scheme for a Council(s)		1,500	60,000	61,500
9. Develop standard drawings in PDF and CAD of standard WSUD features			20,000	20,000
10. Sediment and erosion control - Issue Paper			15,000	15,000
Sub-total 2	**$82,364.68**	**$95,500**	**$157,000**	$359,865
Total	**$203,941.92**	**$200,000**	**$292,000**	$695,942

Note 1: Subject to confirmation of funding partners

7. Evaluation framework

7.1. Program reporting and evaluation

To ensure the Water Sensitive SA capacity building program is constantly evolving to respond to the needs of its partners and broader practitioners, the method of evaluation will include:

- monthly reporting to DEWNR on program activities and financial statement
- three-monthly reporting to program Steering Committee on progress towards performance targets and financial statement
- annual evaluation of program outcomes to feed into the following year's business plan
- a detailed evaluation of the program's impact to date in the middle of year 6 (2019-20) of the program, against KPIs, including a survey to track progress – development in perceived knowledge and awareness for South Australian practitioners.

7.2. Key performance indicators

Performance indicators for key program activities and Water Sensitive SA team member responsibility will include:

Table 7.1 Program activity performance indicators

Outcome/output	KPI	Target
Program Business Planning		
Outcome 1 – Transparency and accountability in business and operational planning and reporting		
	1.1. Annual business plan prepared. Prepare 3 year business plan (review annually), stakeholder engagement plan and training plan	May (preceding relevant financial year)
	1.2. # agenda papers prepared, meeting coordinated for Water Sensitive SA steering committee	4 per annum
	1.3. # of reports prepared – program performance against KPIs and financial management	4 per annum
	1.4. Overall program review undertaken	February 2020
Stakeholder engagement		
Outcome 2 – Inclusivity		
Outcome 2a All relevant practitioners and industry groups are engaged in Water Sensitive SA program development and program delivery.	2.1. # organisations and diversity of industry groups consulted	100% metropolitan Adelaide Councils and key industry associations by July 2021 6 developers/ industry peak bodies consulted
	2.2. # of presentations made by Water Sensitive SA to industry forums/seminars	4 per annum
Outcome 3 – Recognised value of program		
Outcome 3a Financial partners understand the value of their investment and agree the program meets industry needs.	3.1. % of investment partners renewing partnership annually	90%
	3.2. # of new investment partners following release of business plan	3 additional Councils by July 2020 3 other organisations by July 2020
	3.3. Ratio of core NRM funds to matching funding	1:1.5 by 30 June 2021

Outcome/output	KPI	Target
WSUD policy adoption and implementation		
Outcome 4 – Adoption of WSUD performance targets		
Outcome 4a Binding performance targets for water conservation, stormwater runoff quality and stormwater will drive a consistent, equitable approach to WSUD, based upon best practice	4.1. Promote the adoption of the *Green infrastructure and WSUD performance-based policy* project outcomes and seek community and industry wide support for their adoption within the *Planning and Design Code, Standards and Guidelines* 4.2. Commitment by DPTI (Planning) to integrated online stormwater assessment tool within e-planning system	by 30 June 2020 by 30 June 2020
Technical resources development		
Outcome 5 – Technical resources for WSUD projects		
Outcome 5a Agreement reached with interstate and international capacity builders for sharing technical information and which elements SA is to lead Outcome 5b Resources are readily available through a central on-line facility Outcome 5c Practitioners have the guidelines necessary to inform planning, design, construction and maintenance of WSUD assets.	5.1. Sources for all categories of technical information identified and links made on Water Sensitive SA website	Community resources 80% Practitioner resources 70%
	5.2. South Australian users of website	# South Australian users per qtr > 1000 by May 2021
	5.3. Contract(s) signed for provision of missing technical information for which Water Sensitive SA is to take lead	Stormwater assessment tool adopted by practitioners by June 2020 Cost-benefit analysis framework online by June 2019 SA MUSIC Guidelines developed by Dec 2019
	5.4. Quality of SA-produced technical guidance is peer reviewed and assessed to be good	New material peer reviewed and approved
	5.5. Proportion of industry sectors (i.e. planning, design, assess, construct and maintain etc.) for which technical support resources are available on line	All sectors by 30 June 2021
	5.6. % of practitioners citing Water Sensitive SA website as a primary source of information on WSUD technical matters	80% by April 2020
	5.7. % of practitioners reporting resources to support their role in WSUD are available via Water Sensitive SA website	80% by May 2020

Outcome/output	KPI	Target
Training and community of practice		
Outcome 6 – A proficient WSUD practitioner community		
Outcome 6a: Practitioners can deliver best practice integrated water management and WSUD into the planning, design, construction and maintenance of WSUD assets.	6.1. % of practitioners reporting improved ability to deliver best practice WSUD	85%
	6.2. % of practitioners reporting they will apply the learnings in their current role	90%
	6.3. qualitative data on how practitioners will apply the learnings from training	n/a
	6.4. # of collaborations with industry groups/training providers to strengthen the WSUD content of existing courses	2 by June 2020
	6.5. # of full day equivalent courses delivered per annum for priority knowledge and skills gaps	3 per annum
	6.6. # of attendee days in training courses run by Water Sensitive SA	120 per annum
	6.7. % of course attendees reporting that training increased their knowledge of the topic in question	90%
	6.8. % of course attendees reporting that course material and presenter were of a good standard or higher	90%
Outcome 6b: WSUD practitioners are well networked through peer to peer learning opportunities	6.9. # of seminar series held each year	4 per annum
	6.10. # of participants in seminars per annum	160 per annum
	6.11. % of seminar attendees reporting that training/seminar increased their knowledge of the topic in question	90%
	6.12. % of seminar attendees reporting that the presenter was of a good standard or higher	85%
	6.13. Qualitative data on how practitioners will apply the learnings from seminars	n/a
Communications		
Outcome 7 – Communications		
Outcome 7a Increased awareness of best practice, WSUD strategy, policy, techniques and applications.	7.1. # of media releases/media (radio) engagements	2 per year
	7.2. Sponsorship for awards event	1 every 2 years
	7.3. # of e-newsletter subscribers	750 subscribers by 30 June 2020
	7.4. Open rate of e-newsletter emails	30%

Outcome/output	KPI	Target
Outcome 7b Increased trust in WSUD to deliver multiple benefits to the community, environment and economy	7.5. Click rate from e-newsletters	15%
	7.6. # of forum conversations per annum	3 per annum
Research and adoption pathways		
Outcome 8 – Research integration with practitioners		
	8.1. # of potential research projects to address gaps identified by practitioners and communicated to researchers	6 by 30June 2021
	8.2. # of WSUD research programs with clear adoption pathways for SA practitioners	6 by 30 June 2021
	8.3. # of CRCWSC Tranche 2 projects delivered to address SA industry partner needs	3 by 30 June 2021

7.3. Reporting performance

Program management services are provided under a services agreement between Mellissa Bradley Consulting (Program Manager) in collaboration with Kreative Wisdom (Kathryn Bothe, Communications and Events Partner) and the AMLR NRM Board.

The Program Manager will provide a report to Steering Committee no later than July of each year detailing performance against program deliverables, including data of nominated indicators.

The contracts for the Program Manger and Communications and Events Partner with the AMLR NRM Board were extended for a further two years from 1 January 2018 to 31 December 2019. The AMLR NRM Board seeks that the program develops an independent governance model and program delivery services beyond 2019. Alternative structures were considered at a workshop with Department for Water management in June 2019, that recommended two preferred governance options for the future:

- Option 1: DEW external delivery (current model)
- Option 2: DEW – internal delivery

Governance Model	Pros	Cons
Option 1: DEW – external delivery (current model)	▪ Relatively greater freedom for media comment ▪ Reporting compliance not required, e.g. AGMs, annual reports ▪ Flexibility of delivery ▪ Perception of independence ▪ Greater ability to attract investment partners ▪ High alignment with Green Adelaide priorities	▪ Dependent on relationship networks, etc. to influence government departments ▪ Reliance on resourcing of DEW project manager ▪ Need to leverage more money to deliver
Option 2: DEW – internal delivery	▪ Opportunity to fully engage the Green Adelaide Board ▪ Greater ownership of program ▪ Increased internal funding ▪ Utilise resources from across DEW ▪ Potential for influence of other government departments	▪ Staff diverted to other projects/tasks ▪ Deliverables and messaging may be diluted ▪ Change in government – potential to lose program ▪ Potential for less expertise/skills ▪ Risk that industry is less willing to engage

Further development of these options will occur in conjunction with the establishment of the Green Adelaide Board, which will replace the Adelaide and Mount Lofty Ranges Natural Resources Management Board in

7.4. Program risk analysis

To ensure that risks to the quality of program deliverables and the overall longevity of the program are adequately managed, a risk analysis has been undertaken as provided in Table 8.2.

The likelihood, consequence and risk rating tables used in the risk analysis are provided in Tables 8.3 to 8.5.

Table 7.2 Program risk assessment

				"DO NOTHING"				RESIDUAL			
Risk #	Plan Component	Hazard	Hazardous event	Likelihood	Consequence	Risk	Description of control measures/actions	Likelihood	Consequence	Risk	Status/ comments as at June 2019
1.	Communications		Difficulty in reaching target audience	B	4	High	Seek to reach target audience through building or strengthening partnerships with existing industry networks and programs as detailed within Stakeholder Engagement Plan (e.g. AILA, PIA, AIA, Stormwater SA, ASBN, Water Industry Alliance, SA Hyd. Soc, AWA, HIA, Property Council).	D	3	Mod	Strong alliances have been developed with several industry associations and individual developers and builders who are leaders amongst their peers. Further work required to connect with the development industry and master builders.
2.	Communications		Program fails to meet needs of target audience	C	4	High	Evaluation processes must be built into every program activity to keep abreast of practitioner capacity needs and wants.	D	2	Low	3-year review in April 2017 identified areas where program is performing well and areas for further effort, as reflected in the shift in emphasis for WSUD Policy, research adoption and stakeholder engagement program areas.
3.	Communications		Program fails to attract suitable Program Champion	C	3	High	Develop a detailed prospectus to clearly define the expectations and support available for the role.	D	3	Mod	Potential ambassadors identified. Pending narrative for WSUD and Green Infrastructure by DEWNR to be key to "induction kit" for proposed ambassadors.
4.	Investment		Security of ongoing funding	B	5	Ext	Build relationships with potential funders and ensure delivery of a quality program that will attract funding.	D	4	High	3-year program review indicated investment partners very satisfied with program quality and direction. As at

				"DO NOTHING"				RESIDUAL			
Risk #	Plan Component	Hazard	Hazardous event	Likelihood	Consequence	Risk	Description of control measures/actions	Likelihood	Consequence	Risk	Status/ comments as at June 2019
											July 2019 majority of partners seeking to renew agreements
5.	Governance		New governance model is required by June 2020 providing for Water Sensitive SA to become an incorporated independent body or alternative hosting arrangements	A	4	Ext	2019-20 budget has set aside $10,000 for incorporation, or alternative governance arrangement.	D	3	Mod	Risk has reduced from Extreme to Moderate as DEW has indicated that water sensitive urban design is a priority for government. The funding base is broadening as more Councils become engaged with WSSA activities and projects.
6.	Training		Response to training/events low	B	4	High	Work with industry peak bodies who now cross-promote our training and events. Quality core courses have now been developed, with some delivered more than once. Training and seminar series remains flexible to respond to current topical issues.	D	2	Low	Target number of attendees met. Have opted for mix of full-day and half-day courses for 2019-20 and beyond.
7.	Policy and guidelines		Change in state government policy priorities	C	3	High	Work with relevant stakeholders to ensure that WSUD remains relevant to the policy agendas across the political spectrum.	C	2	Mod	Relationship developed with DEW Planning team and DPTI (Planning) managers responsible for *Planning and Design Code, Standards and Guidelines.*
8.	Policy and guidelines		Development industry refusal to support WSUD targets – voluntary or mandated	D	4	High	Upfront engagement via existing industry networks, e.g. UDIA, Property Council of Australia, and government agencies. Workshop policy development.	E	3	Mod	Program will focus on demonstrating the case for WSUD cost/benefits and lifecycle analysis plus development of tools (deemed-to-comply guide

				"DO NOTHING"				RESIDUAL			
Risk #	Plan Component	Hazard	Hazardous event	Likelihood	Consequence	Risk	Description of control measures/actions	Likelihood	Consequence	Risk	Status/ comments as at June 2019
											and online tool) will directly involve UDIA, Property Council, etc. Future case studies will focus on development rather than public realm projects.
9.	Policy and guidelines		Research to fill knowledge gaps not funded	C	4	High	Work with research institutions to undertake further research. Advocate with government/other funding bodies.	D	4	High	Partnership with CRCWSC to provide Regional Manager services, provides greater capacity to influence research. Focus on major need – infill development.
10.	Human resources		Program Manager on extended unplanned leave	E	4	Mod	Systems for events and communications (e-newsletter) are well established. Trusted existing subcontractors would be drawn upon.	E	2	Low	Contractors have been identified to undertake Program Manager functions for extended unplanned leave.
11.	Human resources		Communications & Events Partner on extended unplanned leave	E	4	Mod	Entire program team will be trained in administration of new website. The website development consultants will provide web-admin services if required.	E	2	Low	Program team now experienced in administration of website. ARRIS can provide website support services if needed.

Adapted from Alluvium Consulting & Kate Black Consulting (2012)

7.5. Risk rating tables

Table 7.3 Consequence rating – qualitative measures of consequence or impact

Rating	Descriptor	Explanation
1	Insignificant	Negligible financial loss 9< 5% of project budget). No real disruption to program. No injury or first aid only. No impact on morale. No media or political attention. Some local complaints. No breach of legislation. Minor instance of environmental damage. Can be reversed immediately. Interruption to an event – minimal impact to participants/store holders/others.
2	Minor	Minor financial loss ($200-500 or 5-10% of project budget). Minor financial disruption. Minor variation to budget. Minor medical attention. Negligible impact on morale. Some local media or political attention. Minor community concern. Below 5% of community affected. Minor breach of legislation. Minor impact to environment. Can be reversed in a short timeframe. Minor interruption to event with minor impact to participants/store holders/others.
3	Moderate	Moderate financial loss (10-25% of project budget). Moderate impact to program operations. Moderate variation to budget. Significant injury requiring medical attention. Short-term effect on morale. Significant media attention and public interest. Potential for adverse local media attention. 5-40% of community affected. Breach of legislation with penalties. Moderate impact to environment. Localised damage that has potential to spread and reversed with intensive efforts. Moderate interruption to event. Partial Event Emergency Plan action may be needed.
4	Significant	Major financial loss (25-50% of project budget). Major impact on program operations. Major variation to budget requiring additional funding for event and post-event investigations/actions. Serious long-term injury. Temporary disablement. Significant impact on morale and business. Significant adverse media coverage and public interest. Long-term effect on reputation. 40-70% of community affected. Multiple breaches of legislation with penalties. Severe loss of environmental amenity. Danger of continuing environmental damage. Major interruption to service delivery. Full or partial event emergency plan action may be needed.
5	Catastrophic	Significant financial loss (>50% of project budget). Ceasing program operation. Significant financial impact during and post event, major injury/disablement or death. Long-term effect on morale and future staging of the event. Adverse national media attention. Major embarrassment attention. Major breaches of legislation with maximum penalties. Major loss of environmental amenity – irrecoverable environmental damage. Full event emergency plan action required.

Table 7.4 Likelihood rating – qualitative measures of likelihood

Rating	Descriptor	Explanation
A	Almost certain	Expected to occur at times of normal operations (more than once per year), 95% chance
B	Likely	Will occur at some stage based on previous incidents or in most circumstances (1-2 years), 75-95% chance
C	Possible	Not expected to occur but could under specific circumstances. Might occur (2-5 years), 25-75% chance
D	Unlikely	Conceivable but not likely to occur under normal operations – has occurred at some time (5-10 years), 5-25% chance
E	Rare	Only occurs in exceptional circumstances (>10 years), <5% chance

Table 7.5 Risk rating – qualitative risk analysis matrix

Likelihood		Consequence				
		Insignificant 1	Minor 2	Moderate 3	Significant 4	Catastrophic 5
A (Almost certain)	5	Moderate	High	High	Extreme	Extreme
B (Likely)	4	Moderate	Moderate	High	High	Extreme
C (Possible)	3	Low	Moderate	High	High	High
D (Unlikely)	2	Low	Low	Moderate	High	High
E (Rare)	1	Low	Low	Moderate	Moderate	High