WATER SENSITIVE SA

3-year business plan

2014-15 to 2016-17

July 2015

Authors

This document was prepared by:

Name, title	Mellissa Bradley, Program Manager
Organisation	Water Sensitive SA
Address	PO Box 351, Uraidla
Telephone	0431 828 980
Email	mellissa@watersensitivesa.com

Version history

Date	Document version	Document revision history	Document author/reviser
6 April 2015	1.	Draft for Steering Committee	Mellissa Bradley
14 May 2015	2.	Final Draft for Steering Committee	Mellissa Bradley
12 June 2015	3.	Final	Mellissa Bradley
10 July 2015	4.	Final, with June activity updates Sec 11.3	Mellissa Bradley

Approvals

Date	Document version	Approver name and title	Approver signature
30 June 2015	3.	Water Sensitive SA Steering Committee	
20 July 2015	4.	Water Sensitive SA Steering Committee, Sec 11.3 amendments	

Contents

Tables

Figures

1. Who are we?

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 mission

Our vision 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.

Transition to a water sensitive city

To date, the incorporation of WSUD features into any project or development has been dependent on either the knowledge and/or tenacity of a council development engineer, the progressive nature of an engineering consultant or a forward thinking developer who understands the amenity benefits of WSUD, or perhaps a combination of the above.

Adelaide needs to move beyond "showcase" WSUD developments to a future with WSUD as a mainstream feature of any greenfield land division, brownfield infill development, retrofit of existing housing or industry, and capital works projects.

If South Australia is genuinely aspiring to be a water sensitive city or community, there needs to be a clear understanding of what that means. Rebekah Brown offers the model in Figure 2.1, Transition to a Water Sensitive City, as a means of categorising the various stages of evolution of urban water management design and practice and the drivers for change.

Water Sensitive SA will support South Australia to become a water sensitive community that has sustainability, intergenerational equity, resilience to climate change and the creation of more liveable cities as key drivers. Arguably, we could say that South Australia is beginning to identify itself as a water eycle city with large scale projects like *Water Proofing the South* and the *Glenelg to Adelaide Park Lands Wastewater Recycling Project* (GAP Project), indicating a strong commitment to fit-for-purpose water use. It is, however, the cumulative benefits of design innovation of landscapes and the built form of each and every capital works project or development that will truly carry us forward to become a water sensitive community

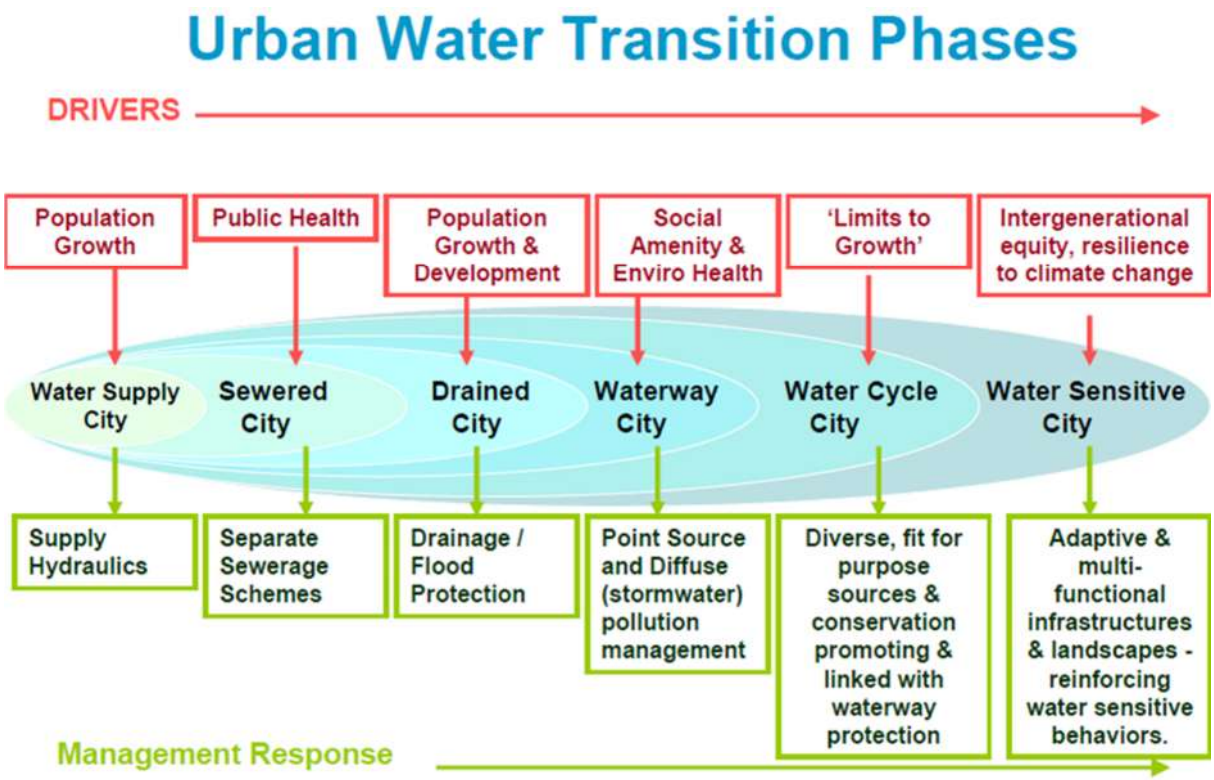


Figure 2.1 Urban water management transitions framework, Source: Brown et al (2008)

Enabling factors for the transition to a water sensitive community

The transition to a water sensitive community is dependent on a number of factors working in combination to deliver systematic governance reform based upon a shared vision and understanding of the barriers to moving forward. Brown (2009) defines these enabling factors as socio-political capital, champions, accountability, trusted and reliable science, market receptivity, bridging organisations, binding targets, strategic funding, and demonstration projects.

The Water Sensitive SA program has been developed with the understanding that binding performance targets, based upon trusted science, are fundamental as a driver for change. The SA WSUD Policy includes performance targets for water conservation, stormwater runoff quality (pollution reduction) and water runoff quantity is provided in Section 3. To facilitate the integration of the targets within policy (planning, building and other incentives), a robust business case and life cycle costing analysis is required, coupled with supporting guidelines and tools for policy and tools for interpretation and application of the policy. Successful WSUD in practice is required to demonstrate how the policy can be applied. At each stage, WSUD champions within organisations, across institutions and the broader community will be required to provide leadership to effect this change.

These factors combined can build the socio-political capital to underpin the institutional and cultural shift necessary to transition to a water sensitive community.

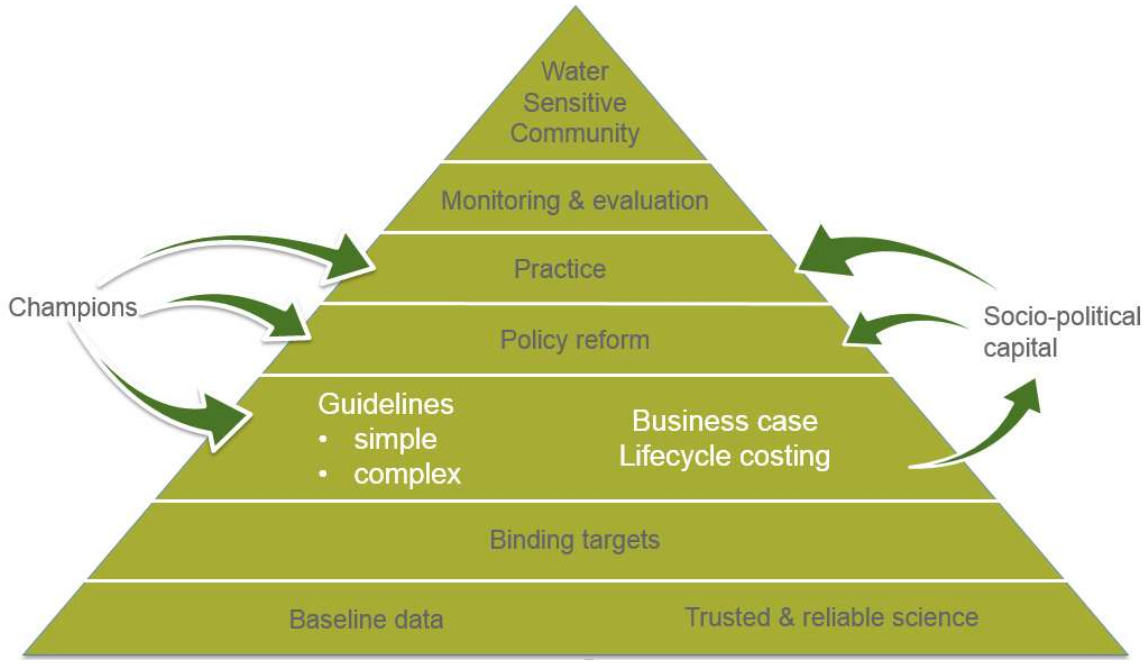


Figure 2.2 Transition factors to enable the water cycle & water sensitive city Adapted from Brown (2007).

Capacity building

Social research by Rebekah Brown (2007) has documented the importance of capacity building programs to enable transition to a water sensitive city or community. The potential of WSUD to add value to the urban landscape has not been fully realised to date. To transform our communities will require a shift in cultural attitudes, policy and practice – a change that can be accelerated by a well-designed capacity building program like Water Sensitive SA.

State government strategic plans and policy documents have evolved to a point such that the WSUD capacity building program is both:

- essential to drive the widespread adoption of WSUD targets in council development plans and the building code
- critical to support practitioners to achieve WSUD outcomes in new developments and capital works projects.

3. Background

South Australia has shown international leadership in stormwater and wastewater re-use, but there is real need and strong demand to become truly water sensitive in our approach to policy, planning, development and implementation.

Water Sensitive SA offers this opportunity. Our capacity-building program provides leadership, supports innovation, grows capability and delivers practical tools to transform South Australia's urban landscape.

Water Sensitive SA supports the urban water management and development industries to achieve the very best water sensitive urban design (WSUD) outcomes for urban developments, capital works projects and other relevant activity, including stormwater network upgrades, streetscape modifications and park upgrades.

Many challenges currently limit the widespread adoption of WSUD in our communities. We are committed to tackling these challenges through the delivery of a high-quality program that is responsive to the needs of current and future partners and stakeholders.

Issue 1 – The case for WSUD (cost/benefits) is not widely understood

The integration of water sensitive urban design into our urban landscape can deliver more liveable, resilient, sustainable and productive cities, in line with state government visions and strategies for climate change adaptation, health and wellbeing, placemaking, marine water quality and economic prosperity. The development of a solid case for WSUD that draws upon the outcomes of trusted research and cost benefit analysis is needed to support decision makers and underpin our transition to a water sensitive community.

Issue 2 – Lack of regulatory drivers for consistency in WSUD uptake and adoption

The SA WSUD Policy was released in November 2013 and provides principles and performance target measures for water conservation, stormwater runoff quality (pollution reduction) and stormwater runoff quantity, refer to Table 3.1. To date the pathway for SA WSUD policy adoption has yet to be defined, however the need for incorporation within the statutory planning system and the building code has been identified. Consistent planning policy, interpretation, assessment and application is needed across local government boundaries to achieve equity for the development industry and multiple benefits for the community. Advocacy is needed at an industry-wide level to create momentum towards achieving more water sensitive outcomes at the local level.

Issue 3 – Need for training and opportunities for peer to peer learning

While several organisations currently offer technical WSUD training there is no central place for practitioners to mix with other disciplines and discuss issues. Poor design, construction, operation and maintenance of WSUD infrastructure presents a financial risk to local government. Infrastructure that needs modification due to lack of knowledge and skills will increase the cost of WSUD. An avoidable cost if practitioners are supported with suitable training and networking with peers on WSUD issues. A forum (face-to-face and online) is required to support peer to peer learning to establish a community of practice

Issue 4 – Need for resources to support practitioners

Multiple industries and professional groups have a responsibility to deliver on WSUD objectives. A single central facility for sharing of WSUD information and resources is needed for SA. There is a lack of awareness and application of existing guidelines and a desire to regionalise several of the interstate guidelines to South Australia's context. Collaboration with interstate WSUD capacity building programs can strengthen the Water Sensitive SA program and gain efficiency in the development of guidelines and tools.

Table 3.1 SA WSUD Policy Extract (DEWNR) WSUD principles and performance targets

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*	Help protect waterways and, where relevant, promote their restoration by seeking to limit flow from development to pre-development 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

[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.

Performance principle	Performance principle intent	STATE-WIDE Performance target	Primary focus
environments on watercourses and their ecosystems	Help to manage flood risk, by limiting the rate of runoff to downstream areas to appropriate levels	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 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 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

4. The case for investment

The value for current and potential partners

Practitioners/peers: Providing the opportunity to up-skill, engage, educate and influence peers, clients and the community in WSUD to improve productivity, enlarge the market, give greater certainty and reduce inter-jurisdictional variations in requirements.

Government institutions: Support for a cultural shift in decision-making in support of SA WSUD Policy development and adoption by providing practical advice and tools to deliver on state/regional level strategies and policies.

Development industry: Water Sensitive SA will afford equity for all developers by advocating for the concurrent adoption of the WSUD policy within all local government areas and will develop resources and tools that will achieve efficiencies and cost savings in the development application and approval processes.

Corporations/organisations: Investing in products, services and projects that align with Water Sensitive SA will provide businesses and organisations with the opportunity to reach new markets, present products and information to practitioners, increase brand awareness, gain feedback from industry and build their reputation.

Researchers: Greater uptake of research and development outputs and informed research and development focused upon matters of value to WSUD policy, planning, practice and assessment.

Community: More liveable communities, lowest infrastructure costs to deliver green sustainable cities and healthy waterways and a better informed community on WSUD and pathways for citizen participation at the household, neighbourhood and broader community scale.

WSUD contribution to South Australian Strategic Priorities

In 2011, the Premier released the seven strategic priorities for South Australia. Integrated water management solutions and WSUD can contribute significantly to several priorities.

Table 4.1 WSUD Contribution to SA strategic priorities

State strategic priority	WSUD contribution
Creating a vibrant city	Maximise the potential of alternative water to irrigate our green urban spaces and integrating water, as part of urban design, into streetscapes and parks, can create engaging spaces that bring community together.
An affordable place to live	Consideration of urban water management at the inception of any development or project creates an opportunity for the most cost effective solutions to be developed that enable multiple benefits to be achieved, e.g. flood mitigation integrated with open space. Establishing more efficient assessment and approval processes associated with water management, in particular stormwater management, can reduce developer costs, contributing to housing affordability.
Safe communities, healthy neighbourhoods	WSUD can contribute to the provision of quality public open spaces that increase community participation and usage providing physical and mental wellbeing benefits. Greater use of public open spaces enhances passive surveillance, making these spaces safer for the community. The cooling (shade/irrigation) benefits of green infrastructure can increase comfort levels for vulnerable sections of the community and encourage more outdoor activity on warmer days.
Premium food and wine from our healthy environment.	Recycled wastewater and stormwater has provided productive benefits to industry, e.g. stormwater: Michell, one of Australia's largest wool processing companies, uses treated stormwater from City of Salisbury scheme and wastewater; Willunga Basin wine grape growers applying recycled wastewater from SA Water's Christies Beach wastewater treatment plant to irrigate crops. Continued innovation in recycled water projects can further increase South Australia's productivity.

Protecting our investment

The ability of the government and industry to manage and transition the current urban water infrastructure network of South Australia to care for urban growth and renewal is a significant challenge. Anecdotal evidence suggests that as developers and governments begin to integrate WSUD into new developments or retrofit of existing suburbs, the lack of understanding of suitable design and construction techniques is resulting in sub-optimal system operation.

There is significant investment in water-related infrastructure in South Australia. Some of the costs associated with urban water infrastructure include:

- $131 million in grants from the Australian Government for urban water projects (excluding desalination) in South Australia (Department of Sustainability, Environment, Water, Population and Communities, 2012)
- $219 million in local and state contributions to stormwater recycling projects
- $24 million through the Stormwater Management Authority ($4 million per year as outlined in the Stormwater Management Authority Annual Report, 2011)
- over $100 million in rainwater tanks across the State.
  Alluvium (2012)

A report by Burns, Roorda and Hope (2001) for the Local Government Association of South Australia put the asset replacement value of stormwater infrastructure at that time at $1.4 billion (or $1.99 billion in 2014 dollars – RBA 2014[3]). The potential to incorporate a WSUD approach to renewal of this asset base is a significant opportunity.

The financial risk associated with an industry that is not suitably skilled to plan, design, construct and maintain new urban water management infrastructure is significant and up-skilling of the workforce is necessary to protect our water infrastructure investments. This underpins the necessity of continued investment in Water Sensitive SA.

Better policy adoption and application

The current planning reform process provides an excellent opportunity to reconsider the potential for WSUD to contribute to more liveable, climate-resilient communities.

Integration of the *South Australian Water Sensitive Urban Design Policy* within the natural resources management policy module of the State Planning Policy Library Council or regional planning schemes will provide a basis for equitable, consistent, best practice outcomes for new developments. The building code also offers further opportunities to support WSUD outcomes, particularly through water conservation measures. **The establishment of binding performance targets for water conservation, stormwater quality and stormwater discharge are a necessary component of the transition to a water sensitive city**. Integration of WSUD principles and design outcomes within the proposed urban design code will assist the delivery of the urban form that communities want and need for wellbeing.

Liveability and healthier communities

The *30 Year Plan for Greater Adelaide,* currently under review, sets out a planning strategy to provide 70% of new dwellings via infill development. It appears that this has supported and helped drive a significant trend in South Australia, with housing allotment sizes progressively decreasing over the last decade. Adelaide's median lot sizes have consistently been smaller than those of Brisbane, Sydney, Melbourne and Perth, and were 375 m^2 in 2011-12.

Given the diminishing opportunity for private green spaces, the current median lot size places even greater importance on quality public open space, supported by best practice water sensitive design.

[3] Reserve Bank of Australia Inflation Calculator – http://www.rba.gov.au/calculator/

Public open space and streetscapes will increasingly be required to deliver multiple benefits to community: amenity, sense of place, urban cooling and recreation.

Paved, impervious areas and lack of trees and shade is also contributing to the urban heat island effect, increasing average temperatures within our suburbs. This can have very serious community impacts. For example, during 1994 and 2009, three or more days over 43°C were found to increase mortality rates in Adelaide by 44% (Williams 2011). Increasing canopy cover by one tenth can reduce daytime temperatures by 1°C (Coutts 2013). The reintegration of stormwater in private and public spaces, and the irrigation of green spaces with recycled water, can make outdoor and indoor environments far more comfortable, particularly for vulnerable sections of the community, an increasingly important consideration as our population ages.

High-quality public open spaces and streetscapes can foster community connectedness through the creation of a sense of place, and increase physical activity and support mental health, which contribute positively to community well-being.

Urban water management that incorporates stormwater harvesting, re-use and infiltration to maintain soil moisture will contribute to a more natural water cycle that can aid the protection or restoration of urban waterways, sustain habitat for biodiversity and support the wellbeing of people.

Flood management

Urbanisation increases the impervious proportion of a catchment, generating greater surface runoff. Increasing rates of development can exacerbate localised flooding unless measures are taken to manage stormwater runoff flow rates and volumes.

The Goyder Institute for Water Research has investigated the impacts of infill development on urban flooding regimes and the types of WSUD treatments that can offer the most effective flood mitigation benefits. This research will inform policy and implementation as we move to a future where WSUD is a mainstream feature of our urban places. Importantly. the Goyder Institute's work reaffirms that the containment of runoff from new developments alone to pre-development levels will not adequately address local flooding issues, retrofit of WSUD within existing suburbs will also be essential.

A combination of measures at the allotment and streetscape scale, together with community green spaces, will be needed to provide for the temporary storage of excess runoff in storm events.

Water security

The prolonged drought of the 2000s demonstrated the impact that extended periods of low rainfall, together with increases in number and length of extreme heat events, can have on catchment yields. Reduced rainfall in southern Australia and historical dependence on the River Murray demands that we have access to a diverse range of alternative water resources, including stormwater, rainwater and recycled wastewater. Large-scale infrastructure projects that match treated stormwater and recycled wastewater with fit-for-purpose uses, including aquifer storage and recovery, were almost unknown 20 years ago. They have now become commonplace, representing cost-effective solutions for Adelaide when compared to traditional storage methods.

The CSIRO forecasts we can anticipate an overall decline in rainfall of between 15-30% by 2050. As we face an uncertain climate future where extreme climate events – including changes in rainfall intensity and patterns – are predicted to increase, the implications on our ability to harvest, store and re-use stormwater need consideration in urban water planning. A diversity of water supplies at a range of scales will build resilience in the wake of these changes.

Water for productivity and economic prosperity

Continued innovation in recycled water projects can further increase South Australia's productivity. In particular recycled wastewater, as a non-climate dependent resource, can provide productivity for industry, food production and sustain irrigated open space and recreational areas, with the benefit of independence from water restrictions.

High quality public open space, particularly those that include water, can increase adjacent residential property values, enhance commercial precincts and improves tourism opportunities.

Stormwater may be used to dilute the salinity of recycled water derived from sewage treatment plants extending the volume of water, range of viable crops and the willingness to pay by irrigators (Vanderzalm et al, 2015).

Improved water quality

The *Adelaide Coastal Waters Study* showed that nitrogen, suspended solids and coloured dissolved organic matter discharged to sea was excessive and contributed to seagrass loss. This reduces habitat for sea creatures that support coastal fisheries, contributes to sand migration on metropolitan beaches which is expensive to offset, and reduces clarity of water which is undesirable for recreation and tourism. With improved wastewater treatment, the proportion of these pollutant loads contributed by stormwater is increasing, and exceeds discharge targets set by EPA (2013) in the *Adelaide Coastal Waters Improvement Plan* reproduce in Section 11.4.

WSUD bioretention and stormwater harvesting are cost effective in reducing these loads in comparison with end of pipe treatments, that would only be intermittently utilised and cost many hundreds of millions of dollars to achieve the targets (Hall M, 2012)

Further details regarding state strategies and polices that are integral to the broad adoption of WSUD are provided in Appendix 11.1

5. The people behind the project

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.

- Keith Downard (chair)
- Dr Peter Dillon
- Baden Myers
- Dr Sheryn Pitman
- Greg Ingleton
- Joe La Spina
- Andrew King
- Andrew Thomas

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

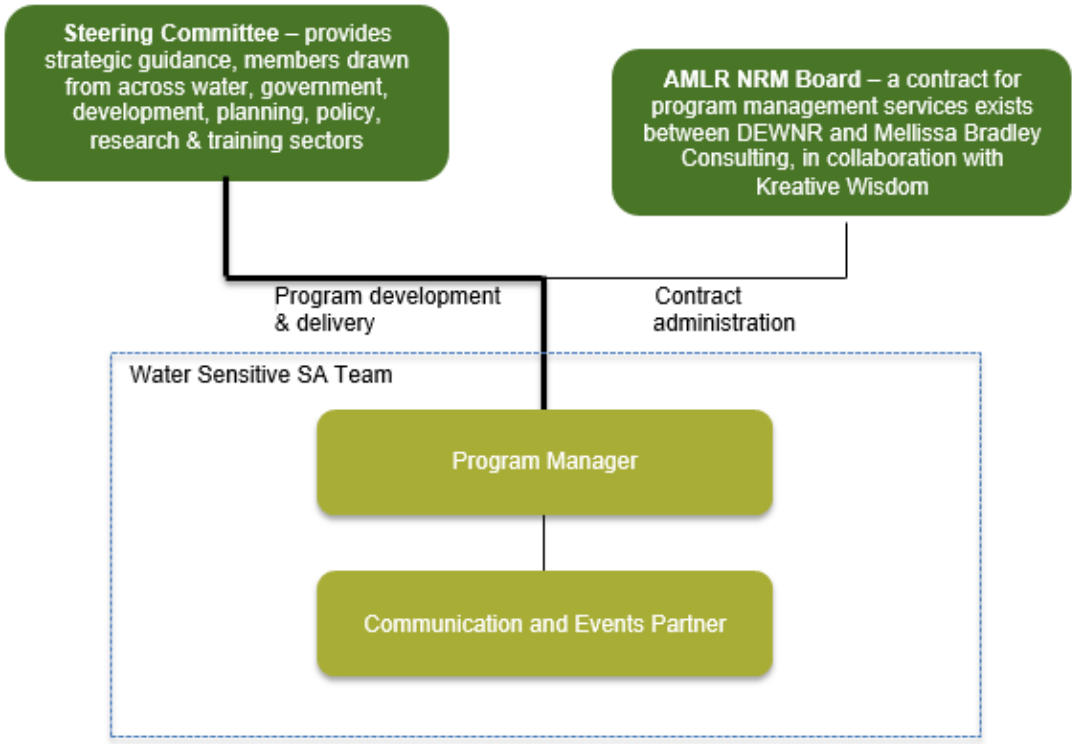


Figure 5.1 Water Sensitive SA Governance structure

Investigations into possible future governance arrangements, including potential incorporation, will be undertaken by the Program Manager under the guidance of the Steering Committee during 2015-16 and 2016-17.

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.

Project partners

The foundational financial partners are: AMLR NRM Board, Local Government Research and Development Scheme, Local Government Association City of Playford, City of Salisbury, City of Port

Adelaide Enfield, City of Charles Sturt, City of Burnside, City of Marion, SA Water, EPA, Stormwater SA and the Australian Government National Landcare Programme.

In addition, the University of South Australia, through Goyder Institute initiatives, provide in-kind program support.

Figure 5.2 Foundational program investment partners

6. Our networks and stakeholders

Water Sensitive SA will engage with and support all professions and industries with a role in the planning, design, construction and maintenance of WSUD.

While practitioners are the key focus of the program, opportunities to communicate our key messages to the broader public will be investigated through working with existing community-based programs of local government and NRM boards and through the media.

Key stakeholders

The SA Water Sensitive Urban Design Capacity Building Program Bridging Program Manager Establishment Plan (2014) prepared by Design Flow identifies the urban design and construction practitioners, for whom the capacity building program needs to cater. This includes:

> Policy makers, planners, urban designers, developers (via HIA, UDIA), engineers, landscape architects, scientists and researchers (e.g. Goyder Institute), civil contractors, asset managers, maintenance contractors, managers and accountants, elected members, and politicians.

Key messages

The CRC for Water Sensitive Cities has developed a definition for a water sensitive city and its features that is becoming widely accepted as preferred terminology and forms the basis for the key messages below.

> Water Sensitive Communities are sustainable, resilient, productive and liveable.

WSUD can:

- make our communities more liveable by enhancing green spaces on both private land and in the public realm, improving overall amenity of the landscape
- improve human thermal comfort to reduce heat related stress and mortality by providing water for our parks, streetscapes, and private gardens to sustain vegetation/trees that offer cooling benefits
- conserve our valuable water resources
- provide at source re-use of alternative water supplies to minimise energy use
- facilitate recycling and re-use of treated sewage effluent
- provide flood mitigation benefits
- protect urban waterways from degradation, through decreased total stormwater runoff and improved flow regimes (more natural high-flows and low-flows)
- reduce pollutant loads entering freshwater and marine environments
- support productive vegetation and increased carbon sequestration
- improve air quality.

Adapted from: CRC for Water Sensitive Cities.

Stakeholder-specific messages

In building the case for WSUD, certain sectors of the urban water management and development industry will be seeking more detailed messages that they can convey to their clients and/or constituents. To support WSUD champions within their respective organisations and industries, the Stakeholder Engagement Plan provides additional messages to inform decisions and practice under the categories liveability, water security/climate resilience, protecting our investment, flood mitigation, planning and development, water for productivity and economic prosperity, water quality, and waterways providing ecosystem services.

Water Sensitive SA will incorporate our general messages and relevant stakeholder specific messages in our communications, to maximise our ability to raise awareness of the benefits of WSUD and the risks of inaction. The following table defines issues that each stakeholder group will either

directly identify with or those issues for which Water Sensitive SA aims to achieve a shift in awareness or attitude, for the particular group.

Table 6.1 Key issues categories for engagement with our stakeholders?

Stakeholder	Key issues category						
	Liveability & healthy communities	Water security/ climate resilience	Protecting our investment	Flood mitigation	Planning & Development Policy	Water for productivity/ economic prosperity	Water quality
Policy makers	✓	✓	✓	✓	✓	✓	✓
Planners	✓	✓		✓	✓		✓
Landscape architects/urban designers	✓	✓	✓		✓		
Developers	✓		✓	✓	✓	✓	
Engineers	✓	✓	✓	✓	✓		✓
Scientists/researchers	✓	✓	✓	✓	✓	✓	✓
Civil contractors/master builders			✓				✓
Asset managers/maintenance contractors	✓	✓	✓	✓		✓	✓
Managers/accountants	✓	✓	✓	✓		✓	
Politicians/elected members	✓	✓	✓	✓	✓	✓	✓
Manufacturers	✓	✓	✓	✓		✓	✓
Community	✓	✓	✓	✓	✓	✓	✓

Stakeholder-specific messages

Water security/ climate resilience

- Greater water security and resilience to a warmer future climate is achieved through diversification of water supplies across a range of scales from allotment, streetscape through to precinct/sub-catchment scale.
- Recycled wastewater is a climate independent water supply.
- Use of fit-for-purpose recycled water in lieu of a potable supply treated to a higher quality can reduce carbon emissions.

Flood mitigation

- To ameliorate flooding we need WSUD in new developments (infill and greenfield) together with retrofit of existing suburbs.
- WSUD can often defer or eliminate the need for drainage infrastructure augmentation to accommodate increased catchment impervious area coverage attributed to urban consolidation.

Water quality

- The contributions of major pollutant sources (nutrients, sediments and coloured dissolved organic matter) have been quantified and attributed to industrial discharges, wastewater discharges and stormwater runoff.
- Stormwater represents the largest source of suspended solids to the marine waters adjacent the Adelaide coastline contributing 6,180 tonnes p.a., 77% of total annual load[3].
- As at 2012, it was estimated that stormwater contributed 150t of nitrogen p.a. to the marine environment from Adelaide's urban catchments[3].
- Since 2003, improved treatment processes combined with recycled water schemes has reduced nitrogen loads to the marine environment from 1136 t/yr[3] to 650 t/yr[4] (2013).
- The systematic integration of WSUD treatment in new development together with strategic retrofits throughout the catchment will make a significant contribution to the removal of fine sediments from the marine environment.
- Biofiltration (bio-retention) systems must be protected during the construction phase of development, via bypass mechanisms.

Liveability and healthy communities

- Embedding water thinking in all phases of urban planning and operations can achieve more liveable and connected cities
- WSUD has multiple benefits to enhance overall liveability of a city/community through:
  - micro-climate management to increase resilience to future extreme heat conditions and reduce heat related morbidity and mortality,
  - green and blue natural landscapes providing mental health benefits and facilitate the physical recovery from illness,
  - more healthy natural ecosystems in urban environments,
  - green infrastructure improving air quality
  - green infrastructure
  - e providing connectivity of community spaces.[1]
- WSUD can
  - replenish depleting groundwater with freshwater,
  - Avoid recharge where increased groundwater levels will have adverse impacts
  - extend baseflows in urban streams and wetlands.
- Alternative water supplied (recycled stormwater/wastewater can provide freedom from water restrictions.
- Heat extremes and the number of days exceeding critical heat-health thresholds are projected to increase in all Australian capital cities in the coming decades.
- For Adelaide the threshold temperature of 43°C was identified, above which mortality rates increase by 2-10%[1].
- Green infrastructure supported by alternative water resources can provide microclimate benefits by reducing excess urban heating (through shading and cooling by evapotranspiration).
- Trees and water bodies (lakes and wetlands) have a significant cooling effect during the day. This cooling effect is apparent, independent of other influential factors[1].
- For each 10% increase in tree cover, there is a reduction in land surface temperature of between 0.5-1°C[1].

Planning & development

- WSUD can add value to the urban landscape
- WSUD can offset the need to upgrade the capacity of downstream stormwater drainage infrastructure
- WSUD performance measures, or targets, for stormwater runoff quality and quantity, provide for:
  - flexibility in design solutions
  - equity due to a consistent approach across council areas
- Water Sensitive SA will support Local Government and industry in the interpretation and application of WSUD policy to ensure consistency in its application.
- At source water re-use and infiltration can retain moisture in the soil profile providing more sustainable green spaces
- A variety of allotment scale WSUD solutions exist and can be adapted to suit individual site constraints, including: building footprint minimisation, permeable paving, on-site retention (rainwater tanks, sub surface storages), raingardens and swales.
- A decision support tool for developers can support efficient outcomes on competing OSD/OSR needs for building code, planning policy and bush fire management.

Protecting our investment

- WSUD can often defer or eliminate the need for drainage infrastructure augmentation to accommodate increased catchment impervious area coverage attributed to urban consolidation.
- Fit-for-purpose use of alternative water can avoid capital or operating costs for potable supply schemes or defer supply augmentation costs.
- Infrastructure renewals provide excellent opportunities for strategic and opportunistic investment in stormwater harvesting, infiltration and treatment systems to maximize multiple benefits to water quality, stream hydrology (return of base flows), geomorphology.
- The community value high quality public open space, particularly those that include water.
- A contribution to sustainability is seen as a market advantage by residential developers[2].
- The amenity benefits of recycled water are considered desirable features when householders are choosing between locations.

[1] Cities as Water Supply Catchments

[2] Marsden Jacobs (2013) Economic viability of recycled water schemes.

[3] Environment Protection Agency, (July 2013) *Adelaide Coastal Water Quality Improvement Plan*

[4] Personal Communications. Ingleton, G., SA Water (2015)

Professional and industry networks

Water Sensitive SA joins other state-based WSUD capacity building programs including Water by Design (South-East Queensland), Clearwater (Victoria), WSUD.org (New South Wales) and New WAter Ways (Western Australia), and will establish an alliance for collaboration and resource sharing with these organisations.

With WSUD practitioners struggling to maintain connections with their existing network base due to competing work pressures, Water Sensitive SA will make use of existing formal industry associations and less formal networks wherever possible to engage with practitioners, including:

- Professional industry associations: Stormwater Australia; Stormwater SA; Planning Institute of Australia (SA); Australian Water Association (AWA); Hydrological Society of SA (HSSA), International Association Hydrologists (IAH)
- Local government: Australian Local Government Association (ALGA); Local Government Association of SA; Institute of Public Works Engineering Australia (IPWEA); Local Government Asset Managers Network; Eastern Region Alliance
- Development industry: UDIA; Property Council; HIA; Civil Contractors Federation (CCF); Construction Industry Training Board (CITB); Master Builders Association (MBA)
- Manufacturing: Water Industry Alliance
- Related programs: Green Infrastructure Program; Resilient South Project
- Researchers: Goyder Institute for Water Research, CRC for Water Sensitive Cities and Australian Water, Australian Water Recycling Centre of Excellence (AWRCoE)

Water Sensitive SA will actively engage with these organisations and networks to promote WSUD and seek their input on further development of the program, as detailed in the Water Sensitive SA Stakeholder Engagement Plan.

Our ability to work with our stakeholders to develop adoption pathways for research will be enhanced as we will also monitor developments by international research associations including Water Environment Research Foundation (WERF), Water Research Foundation (WRF), Re-Inventing the Nation's Urban Water Infrastructure (ReNUWIt), EU Water Research Framework Programs e.g Demonstration for a Competitive and Innovative European Water Reuse Sector (DEMOWARE) and Managed Aquifer Recharge Solutions (MARSOL).

7. Our program

ASPIRATIONAL PROGRAM GOAL

Water Sensitive Urban Design (WSUD) is an integral component of any development or infrastructure project and is considered vital in facilitating the systemic transition to water sensitive communities. 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 and priority watercourses in 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 food production
- Urban watercourse protection with high quality aquatic and biodiversity outcomes
- Integrated climate change adaptation using water to green our suburbs and reduce heat island effects.
- Reduced flood risk

	INTERMEDIATE OUTCOMES	ACTIVITIES
Policy development	• Decision makers and communities understand the multiple benefits of WSUD including enhanced liveability, resilience, sustainability and productivity. • Consistency and equity in the application of WSUD in new developments and infrastructure projects.	• Facilitate the incorporation of practitioner expertise into agency processes to develop an implementation framework for SA WSUD policy. • Advocate for changes in WSUD policy and practice in government, industry and public forums.
Technical resources	• Practitioners have the guidelines and tools necessary to inform planning, design, construction and maintenance of WSUD assets.	• Review existing technical guidelines for WSUD in SA and regionalise several interstate guidelines in partnership with other WSUD capacity building programs. • Create resources, including online tools, and deemed to comply guidelines, to support implementation of WSUD policy.
Communications	• Practitioners and the broader community are informed of techniques to apply WSUD over a range of scales.	• Deliver 'Water for Liveability' campaign to raise practitioner and community awareness of the benefits of WSUD and how it can be applied. • Case studies, e-newsletters, blogs and online forums.
Coordinated approach to training	• Practitioners efficiently deliver best practice integrated water management and WSUD technologies, with reduced financial risk.	• 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.
Institutional capacity	• 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.	• 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).
Protecting our investment	• The whole-of-life costs of WSUD assets are understood.	• 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.
Research	• Accessible research increases practitioner trust in the benefits and application of WSUD.	• Work with researchers such as the 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.

Figure 7.1 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.

Our core business deliverables

Table 7.1 Water Sensitive SA core business deliverables

Outcome/output	Activities
Program Business Planning	
Outcome 1 – Accountability and reporting	
Outcome 1a – Transparency and accountability in business and operational planning and reporting	1.1. Prepare 3 year business plan (review annually), stakeholder engagement plan and training plan.
	1.2. Executive support to Water Sensitive SA Steering Committee
	1.3. Program performance and financial management reporting
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. Deliver a government and industry campaign seeking the SA WSUD policy adoption within planning policy and the building code, though professional networks and industry associations.
	2.2. Present to industry forums/seminars to raise awareness of the case WSUD and the mechanisms and opportunities for transition to a water sensitive community
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. Involve our partners in the development of our business and operational plans.
WSUD policy adoption	
Outcome 4 – Adoption of WSUD performance targets	
Adoption of existing SA WSUD Policy 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 SA WSUD Policy on Water Sensitive SA website and seek community and industry wide support for their adoption
	4.2. Facilitate cross agency/local government workshops and discussions to identify the most effective pathway for adoption of the WSUD policy.
	4.3. Work with researchers and other interstate capacity building programs to develop the case for WSUD including a cost benefit analysis

Outcome/output	Activities
	4.4. Coordinate practitioner input into the scoping and implementation of a life cycle cost analysis for a range of WSUD element types for capital works and retrofit projects and across a scales of development types
Resources development	
Outcome 5 – Technical resources for WSUD projects	
Outcome 5a Resources to support planning, design, construction and maintenance of WSUD elements are readily available through a central on-line facility Outcome 5b Practitioners have the guidelines necessary to inform planning, design, construction and maintenance of WSUD assets.	5.1. Provide a central hub (Water Sensitive SA website) for WSUD resources and information.
	5.2. Develop case studies to share the stories and learnings from successful WSUD projects across a range of scales and project types
	5.3. Coordinate practitioner input into project scoping and implementation for the development of a deemed to comply guideline to inform the proposed urban design code (under the planning reform)
	5.4. Coordinate practitioner input into project scoping and implementation for the develop an online tool for stormwater design and assessment of simple/small scale developments
	5.5. Coordinate practitioner input into the review and update of WSUD technical guidelines for SA
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. Outcome 6b: WSUD practitioners are well networked through peer to peer learning opportunities	6.1. Prepare a training and community of practice plan to address knowledge and skills gaps
	6.2. Procure training providers and coordinate delivery of 4 full day training courses per year to address the needs of planning, detailed design, construction and maintenance of WSUD assets.
	6.3. Liaise with existing training providers that service our target stakeholder groups to seek amendments to existing courses to better integrate WSUD into the curriculum (e.g. surveyors, plumbers etc.)
	6.4. Source presenters for seminar series, host and facilitate workshops to establish a community of practice, fostering peer to peer learnings
Communications	
Outcome 7 – An informed WSUD practitioner community, together with broader public	
Outcome 7a	7.1. Deliver a community campaign through mainstream media, and social media to raise awareness of the benefits of water sensitive urban design as an integral component of our urban landscape and the risks of no action and enable active participation of citizens.

Outcome/output	Activities
Increased awareness of best practice, WSUD strategy, policy, techniques and applications. Outcome 7b Increased trust in WSUD to deliver multiple benefits to the community, environment and economy	7.2. Develop a Water Sensitive SA award to promote the successes of the industry – include categories for local government and developer (large scale and small scale)
	7.3. Research and prepare bi-monthly e-newsletters to keep practitioners up to date with the latest research, policy, strategy and practice from both SA and interstate.
	7.4. Moderate on-line forums to address emerging technical, strategy and policy challenges.
	7.5. Source guest writers of blog articles to provide a more detailed insight into current research and practice
	7.6. Moderate blog article on-line comment and discussions
	7.7. Develop and actively manage a social media campaign via LinkedIn and Twitter
Research & adoption pathways	
Outcome 8 – Research integration with practitioners	
Outcome 8a – WSUD research is accessible to practitioners	8.1. Collaborate with researchers to make research outcomes more accessible to practitioners, clarifying potential adoption pathways
Outcome 8b – WSUD research addresses practitioners knowledge gaps	8.2. Collaborate with researchers to develop research projects to address knowledge gaps

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 7.2 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.

Our training plan sets out the key competencies sought through the delivery of each course as the basis for procuring service providers to deliver training for the identified priority knowledge and skill gaps. In addition to delivering a comprehensive training program, Water Sensitive SA will work with existing institutions and training providers for professions such as surveyors, master builders and plumbers with a view to enhancing WSUD concepts and technical information in their syllabuses where appropriate.

Table 7.2 Indicative Training and Seminar Series Schedule

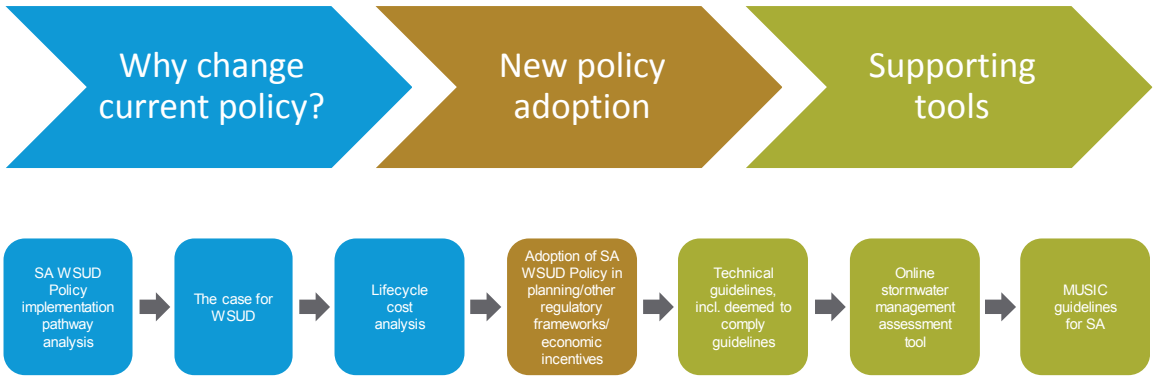
Date	Training/ Seminar	Topic
2015-16		
July 2015	Training	Introduction to biofiltration guidelines
August 2015	Training	Detailed design of biofiltration systems
September 2015	Training	Introduction to WSUD for policy planners and development assessment planners and engineers (V)[1]
October 2015	Seminar	WSUD and micro climate benefits – theory and practice (V)
November 2015	Training	Leadership to advance water sensitive urban design
February 2016	Training	Detailed design of wetlands
March 2016	Seminar	Plant species selection in WSUD infrastructure for pollutant removal and amenity, suited to SA conditions (V)
April 2016	Seminar	Managed aquifer recharge schemes – the challenges and remedies
May 2016	Training	Establishment and Maintenance of vegetated stormwater management systems
June 2016	Seminar	Infill development – the opportunities for WSUD to enhance liveability, sustainability and resilience (V)
2016-17		
July 2016	Training	Detailed design of harvesting systems and associated monitoring (V)
August 2016	Seminar	Getting balance back into the urban water cycle - Street scale infiltration solutions (V)
September 2016	Seminar	Better understand the direct and in-direct costs and benefits of WSUD (V)

October	2016	Training	Detailed design of infiltration systems
November	2016	Seminar	Reserved for emerging research – adoption pathway
February	2017	Seminar	Reserved for emerging research – adoption pathway
March	2017	Training	Detailed design of WSUD elements for landscape architects and urban designers
May	2017	Training	Interpretation and application of deemed to comply guideline and on-line stormwater assessment tool (V)
June	2017	Training	MUSIC Guidelines (interpretation and application) (V)

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

Priority projects

Practitioners in South Australia are actively seeking knowledge and skills in regard to "how" they effectively implement WSUD on the ground. The Water Sensitive SA Capacity Building Program will focus heavily on providing "supporting tools" with practical guidance on how to implement WSUD. There is, however, a small yet critical proportion of our target market who have yet to be sold on the "why". The case for WSUD demonstrating the multiple benefits to liveability of our urban areas and resilience in a future warmer climate, together with benefits to watercourse health, flood management, heat island effect and amenity needs to be provided for policy makers, other decision makers (e.g. council-elected members) and the development industry. Access to a thorough cost benefit analysis and an understanding of lifecycle costs will be critical for acceptance of WSUD by some sectors.



A suite of priority projects have been identified that are fundamental to the widespread adoption of WSUD and seek to address these essential needs. Water Sensitive SA will draw upon the expertise of SA practitioners to prepare a scope of works for each of these projects, to ensure the needs of the industry are met:

Economic analysis and the case for WSUD

The state government will require a detailed economic analysis of the implications of the SA WSUD Policy prior to embedding the policy within the planning system and other regulatory frameworks. Essentially, the case for WSUD needs to be developed in the context of a cost/benefit comparison with conventional design techniques across a range of scales of development, i.e. allotment, small-scale subdivision and large scale subdivision. This case should address the multiple benefits of WSUD and include valuation of externalities that are not traditionally included in a cost benefit analysis.

Water Sensitive SA will work with local government, state agencies, researchers and industry to prepare the scope of works for the following priority projects to fill the knowledge gaps for policy and decision makers.

Priority project 1: The case for water sensitive urban design – benefit/cost analysis

Objective	Demonstrate the multiple benefits (including externalities) of incorporating WSUD into new developments and retrofit solutions while seeking the lowest community cost solutions to urban water management challenges
Deliverables	A reference document to inform policy and infrastructure management decisions that identifies • urban water management solutions with the lowest community cost • who pays • who benefits • what changes to the urban water cycle are required • what are the community benefits inform policy decisions and provide assurance for the development industry The analysis will consider: • threats to communities (droughts, floods, heat waves, population growth, aging infrastructure, reduced livability and affordability) • financial cost and benefits • intangibles/externalities
Inputs	• DPTI methodology for economic analysis • DEWNR economic model for assessing WSUD projects (currently under development) • Research by Goyder Institute (Cuddy et al 2014, Marsden Jacob Associates, 2013, CRC for Water Sensitive Cities)
Delivery method	Consultancy, overseen by Water Sensitive SA technical working group
Scope of works due	July 2015
Project completion date	March 2016
Potential delivery partners	DEWNR, Goyder Institute for Water Research, DPTI (Planning Division), Green Infrastructure Project, CRC for Water Sensitive Cities, AWRCoE and interstate WSUD capacity building programs
Target audience	Policy makers, Minister, SA parliament, Councils, development industry

Priority project 2: Life cycle cost analysis

Objective	Provide a financial planning resource for use by councils in preparing estimates and budgets based on whole of life cycle costs for a range of WSUD assets
Deliverables	Document the costs associated with implementing capital works and retrofit WSUD assets from planning and design through to construction and maintenance, including a suite of development scenarios across a range of scales. Asset types to be included: wetlands, sedimentation basins, on-street raingarden, bioretention basin, tree pits, grassed swale and buffer strip, gross pollutant traps, infiltration systems and third pipe recycled water schemes
Inputs	The project will draw upon existing work by Melbourne Water (Water Sensitive Urban Design Life Cycle Costing – Data Analysis Report, 2013) and others
Delivery method	Consultancy, overseen by Water Sensitive SA technical working group
Scope of works due	July 2015
Service provider	Open tender
Project completion date	July 2016
Potential delivery partners	CRC for Water Sensitive Cities, Goyder Institute for Water Research, AWRCoE Green Infrastructure Project, IPWEA, Local Government Asset Managers Network, and interstate WSUD capacity building programs
Target audience	Policy makers, Minister, SA parliament, Councils

Guidelines and tools

Other national capacity building programs have indicated an openness to work with the Water Sensitive SA Program to share resources where possible. This will enable Water Sensitive SA to efficiently develop a portfolio of resources for the SA context to inform new development, together with projects to retrofit WSUD for existing urbanised areas, at a fraction of the cost of going it alone.

A significant proportion of Water Sensitive SA partners are grappling with the challenge of the cumulative impacts of small scale developments within highly urbanised areas that are considered by some to have limited opportunities for innovation in water management. The development of deemed to comply guidelines and an associated on-line design and assessment tool for small scale or simple developments can foster the adoption of water sensitive urban design techniques while offering increased efficiency in the development approval process.

Simple or small scale developments

Priority Project 3: Deemed to comply guideline (potential ultimate inclusion in proposed Urban Design Code)

Objective	To provide a companion guideline for the on-line tool for stormwater management (Project 4) for simple/small scale developments
Deliverables	A technical guideline as to how the WSUD policy can be achieved for different scales of development, e.g. allotment, townhouses, simple/small-scale subdivision and associated streetscapes, multi-story apartments and commercial developments to improve the quality of outcomes and increase the efficiency of development assessments
Delivery method	Consultancy, overseen by Water Sensitive SA technical working group
Scope of works due	Aug 2015
Service provider	Open tender
Project completion date	June 2016
Potential delivery partners	DPTI (Planning), CRC for Water Sensitive Cities, Goyder Institute for Research, Green Infrastructure Project, PIA, AILA, UDIA, Property Council, HIA, Local Government, SA Water and interstate capacity building programs
Target audience	Developers, Councils
Dependent activities	SA WSUD Policy Adoption within planning system

Priority Project 4: On-line assessment tool for stormwater management

Objective	To provide an efficient development application assessment process for stormwater management proposals for simple/small-scale developments that allows for flexibility in the solutions depending on site constraints
Deliverables	A decision support and assessment tool to guide options for stormwater management solutions for small scale/simple developments that: • provides a web-based assessment of a the stormwater development proposal relative to the stormwater performance targets within the SA WSUD Policy • demonstrates compliance with SA WSUD Policy for Councils and other statutory authorities
Inputs	The design of the tool will be informed by the Melbourne Water Storm calculator and the City of Gosnell's stormwater design calculator.
Delivery method	Consultancy, overseen by Water Sensitive SA technical working group
Scope of works due	Aug 2015
Service provider	Open tender
Project completion date	June 2016
Potential delivery partners	DPTI (Planning), CRC for Water Sensitive Cities, Goyder Institute for Research, Green Infrastructure Project, PIA, AILA, UDIA, Property Council, HIA, Local Government, SA Water and interstate capacity building programs

Target audience	Developers, Council engineering development assessors
Dependent activities	SA WSUD Policy adoption within planning system

More complex developments

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) is a modelling tool that simulates the behaviour of stormwater in urban catchments, enabling estimation of the pollutant load emanating from the stormwater runoff associated with a development and can estimate the pollutant reduction capability of a range of stormwater treatment measures such as raingardens, wetlands etc. Each time a consultant uses the MUSIC model to undertake this analysis they must calibrate the model for the local conditions, i.e. soil types, rainfall/runoff characteristics.

The ability of the model to accurately predict stormwater runoff will be highly dependent on the model calibration. It is proposed that guidelines for SA specific conditions, for a range of localities, e.g. Adelaide plains, Mount Barker etc. be developed to (i) reduce the risk of incorrect assumptions in the model calibration resulting in outputs that do not accurately reflect catchment conditions and (ii) improve the efficiency in this process by having a set of criteria for SA conditions.

Priority Project 5: MUSIC (version 6) Guidelines for SA

Objective	To ensure a consistent, reliable and accurate approach to stormwater quality modelling and assessment in SA, calibrated to SA conditions
Deliverables	A reference document to guide design engineers including: • SA WSUD performance targets for stormwater • Catchment model set-up (meteorological data, rainfall runoff, pollutant export parameters, etc.) • Stormwater treatment nodes (configuration and parameters) • Interpretation of results • Reporting for development assessment
Inputs	Goyder Institute for Water Research recommendations on model input parameters The project will also draw upon the existing guidelines developed by Queensland WSUD capacity building program, Water by Design
Delivery method	Consultancy, overseen by Water Sensitive SA technical working group
Scope of works due	October 2015
Service provider	Open tender
Project completion date	April 2017
Potential delivery partners	Goyder Institute for Water Research, University of SA, Stormwater SA, IPWEA, Local Government Asset Managers Network, interstate WSUD capacity building programs
Target audience	Consulting engineers, developers, Councils
Dependent activities	Nil

Technical guidelines for development and infrastructure projects

A number of the interstate WSUD capacity building program have been in existence for up to ten years and have amassed over this time a wealth of informative technical documents. In 2009 the then Department of Planning and Local Government released the SA WSUD Technical Manual which provided SA practitioners with a resource to introduce them to WSUD principles.

WSUD practice and the techniques to demonstrate best practice design options have evolved in recent years and SA practitioners are seeking the best resources available to assist them to deliver better outcomes for their clients and the community. Water Sensitive SA will review SA and interstate resources to develop a suite of technical documents that best meet industry needs.

Priority project 6: Review of SA WSUD Technical Manual and other resources to develop suite of guidelines for SA

Objective	To provide a set of WSUD technical guidelines for SA
Deliverables	A comprehensive set of guidelines for SA to inform WSUD planning, design, construction and maintenance
Inputs	Review SA WSUD Technical Manual and interstate guidelines for WSUD design and implementation
Delivery method	Consultancy, overseen by Water Sensitive SA technical working group
Scope of works due	July 2015
Service provider	Open tender
Project completion date	June 2017
Potential delivery partners	DPTI (Planning), Goyder Institute for Water Research, IPWEA, Green Infrastructure Project, PIA, AILA, UDIA, Property Council, HIA
Target audience	Developers, Councils
Dependent activities	SA WSUD Policy Adoption within planning system

8. Budget estimates

8.1. Income

A group of highly motivated and engaged investment partners have contributed the $175,000 (plus GST) needed to establish Water Sensitive SA.

The budget estimates provided in Table 8.1 are based upon existing grant agreements between the AMLR NRM Board and Water Sensitive SA investment partners. A selection of partners chose to commit funds for the initial three-year program, while others chose to consider their commitment on an annual basis.

2014-15 to 2016-17 income summary

Table 8.1 Projected income initial three years of program

	Income (as per grant agreement) per financial year (+ GST)			
Funding partner	2014-15	2015-16	2016-17	Total
Adelaide and Mount Lofty Ranges NRM Board	100,000	100,000	100,000	300,000
City of Burnside	5,000	5,000	5,000	15,000
City of Charles Sturt	5,000			5,000
City of Marion	5,000			5,000
City of Port Adelaide Enfield	5,000	5,000	5,000	15,000
City of Playford	5,000			5,000
City of Salisbury	10,000			10,000
Local Government Research & Development Scheme	25,000			25,000
SA Water	5,000	5,000	5,000	15,000
Stormwater SA	10,000			10,000
Local Government Association		10,000		10,000
EPA Catchments to Coast Program		5,000		
Australian Government – National Landcare Programme		5,000		10,000
Total	175,000	135,000	115,000	425,000

8.2. Expenditure

Budget estimates have been prepared based upon the current level of investment as detailed in Table 8.2 below. Commencing at the start of November 2014, total expenditure for 2014-15 is expected to be $150,000, enabling the carry-over of $25,000 into 2015-16, to supplement the current secured income.

Program establishment activities such as the preparation of the business plan, development of a new website, and Water Sensitive SA identity and associated business document templates are reflected in the higher expenditure estimates for program management, resources development and communications budget lines.

2014-15 to 2016-17 budget estimates summary

Table 8.2 Program 3-year budget estimates within current committed funds

Deliverable	Expenditure (+ GST)			
	2014-15[4]	2015-16	2016-17	3 year total
Program management[1]	21,300	18,000	15,400	54,700
Stakeholder engagement	13,500	14,000	3,000	30,500
Research and adoption pathways	3,500	8,500	2,500	14,500
WSUD policy/ implementation	9,700	20,000	6,000	35,700
Technical resources development[2]	39,500	12,000	11,600	63,100
Training and community of practice	46,000	68,500	63,000	177,500
Communications[3]	16,500	19,000	13,500	49,000
Total	$150,000	$160,000	$115,000	$425,000

Note 1: Reporting to steering committee and DEWNR, Business Plan, Investment Prospectus , development of priority project scope of works (year 1), admin.
Note 2: Year 1 includes new website development, interactive map, SA WSUD sites case studies and image gallery
Note 3: Year 1 includes brand development
Note 4: 7 months of program, commencement in 2014-15

The program's core functions for 2015-16 are predominantly secured ($160,000 of $165,000 budget estimate). To fulfil the program goals and deliver the full suite of activities within our core functions, as proposed within the business plan, further investment of $70,000, the majority being required for year 3 (2016-17), is needed. A significant proportion of the additional funds in year 3 will provide for greater accessibility to research outcomes for practitioners as the Water Sensitive SA will have resources to liaise with researchers, synthesise the research outcomes and develop adoption pathways together with practitioners. Our capability to support practitioners in the pursuit of new research projects to address knowledge gaps will also be greatly increased under the investment regime proposed below.

A further $410,000 is sought over 2 years to enable the delivery of a suite of priority projects, the outcomes of which are fundamental to overcoming primary barriers to the broad uptake of water sensitive urban design throughout our communities. These projects are described in Section 7 of this plan. Savings may be possible through collaborations with interstate capacity building programs for a number of these projects, an option that Water Sensitive SA will pursue during 2015-16.

Table 8.3 Program 3-year budget estimates to fulfil nominated goals and outcomes (subject to additional investment)

Deliverable	Expenditure (+ GST)			
	2014-15	2015-16	2016-17	3 year total
Part A – Core functions				
Program management	21,300	18,000	18,000	57,300
Stakeholder engagement	13,5,000	14,000	10,000	38,000
Research and adoption pathways	3,500	8,500	39,000	50,500
WSUD policy/implementation	9,700	20,000	4,000	33,700
Technical resources development	39,500	14,000	27,000	80,500
Training and community of practice	46,000	71,500	68,000	185,500

Deliverable	Expenditure (+ GST)			
	2014-15	2015-16	2016-17	3 year total
Communications	16,500	19,000	19,000	54,500
Sub-total 1	$150,000	$165,000	$185,000	$500,000
Part B: Priority projects				
Case for WSUD – cost benefits analysis		40,000		40,000
Lifecycle cost analysis		40,000		40,000
Technical guidelines review and update/adapt – SA and interstate			120,000	120,000
Deemed to comply guideline – urban design code		60,000		60,000
Online tool for simple/small-scale developments			100,000	100,000
MUSIC (stormwater quality model) Guidelines for SA			50,000	50,000
Sub-total 2	-	140,000	270,000	410,000
Total	**$150,000**	**$305,000**	**$455,000**	**$910,000**

The program has seed funding for the first 3 years, 2014-15 to 2016-17. It is envisioned that there will be an ongoing need amongst practitioners for continued capacity building support beyond this intial three year program, as the cultural, system and practice changes necessary to transition to a water sensitive community will require continued effort to the end of the decade and beyond.

Governance and funding arrangements post June 2017 will be investigated by the Water Sensitive SA Steering Committee during 2015-16 and 2016-17.

Figure 8.1 Investment sought to deliver full program

Water Sensitive SA will work with interstate WSUD capacity building programs, the Goyder Institute for Water Research, CRC for Water Sensitive Cities, etc. to leverage off these programs to gain synergies and efficiencies.

8.3. Broadening our funding base

A copy of the Business Plan and the Investment Prospectus will be provided to current partners and potential future partners seeking commitment to the program for the 2015-16 financial year. Water Sensitive SA anticipates several additional Councils to become investment partners, potentially committing up to $5,000 each financial year, however, this alone will not address the funding shortfall.

The model of state government agencies and local councils funding external programs works well when values and objectives align closely. Despite this shared goal with existing partners, the current narrow funding base has been identified as a risk to the longevity of the program (refer to Section 9.5) and it is questionable whether this model can be sustained in the longer term.

The experience of similar programs around Australia is that a diverse funding base provides the greatest security against changes in budgetary priorities. Gaining the financial commitment of a diverse range of funders is also an effective way to gain buy-in for the program with a greater spectrum of stakeholders (Alluvium, 2012).

Potential future investors with shared values and needs will be sought to fund the portfolio of activities. An option to fund specific activities may be offered.

Table 8.4 Potential delivery partners and/or co-investors

Project	Scale at which project could be addressed (national or state)	Potential delivery partners and/or co-investors
Project 1: Case for WSUD – cost benefit analysis tool and its application to case studies	National/international	DEWNR, Goyder Institute for Water Research, DPTI (Planning Division), Green Infrastructure Project, CRC for Water Sensitive Cities, AWRCoE and interstate WSUD capacity building programs
Project 2: life cycle costing analysis, for a suite of development and WSUD infrastructure scenarios with application to case studies	National	CRC for Water Sensitive Cities, Goyder Institute for Water Research, AWRCoE Green Infrastructure Project, IPWEA, Local Government Asset Managers Network, and interstate WSUD capacity building programs
Project 3: Deemed to comply guideline – urban design code	State	DPTI (Planning), CRC for Water Sensitive Cities, Goyder Institute for Research, Green Infrastructure Project, PIA, AILA, UDIA, Property Council, HIA, Local Government, SA Water and interstate capacity building programs
Project 4: Online assessment tool for stormwater management for simple/small-scale developments	State	DPTI (Planning), CRC for Water Sensitive Cities, Goyder Institute for Research, Green Infrastructure Project, PIA, AILA, UDIA, Property Council, HIA, Local Government, SA Water and interstate capacity building programs
Project 5:MUSIC (stormwater quality model) Guidelines for SA	National with state refinements	other interstate capacity building programs, engineering consultants
Project 6: Technical guidelines review and update/adapt – SA and interstate	National with state refinements	DPTI (Planning), Goyder Institute for Water Research, IPWEA, Green Infrastructure Project, PIA, AILA, UDIA, Property Council, HIA

9. Evaluation framework

9.1. 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:

1. Where WSUD targets need clarification, these are clarified by June 2016 or research is implemented to confidently allow adoption of defensible mandatory requirements.
2. WSUD policy framework for adoption is agreed by June 2016.
3. Metropolitan and Greater Adelaide Councils have commenced development plan amendments to incorporate WSUD targets within their development plans by June 2017.
4. 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.
5. Council/private practice – planners, landscape architects and engineers report an increased practical understanding of WSUD principles and practical application, relative to the baseline awareness and knowledge levels established by Alluvium Consulting and Kate Black Consulting (2012).
6. The program has secured funding from a mix of government (local, state and federal) and industry sources to ensure sustainability for another three to five years and beyond.

9.2. Program 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:

- regular (three monthly) reporting to DEWNR on program activities
- regular (three-monthly) reporting to program Steering Committee on progress towards performance targets
- annual evaluation of program outcomes to feed into the following year's business plan
- a detailed evaluation of the program's impact to date at the end of year 2 (2015-16) of the program, against KPIs
- a survey to track progress - development in perceived knowledge and awareness for South Australian practitioners.

9.3. Key performance indicators

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

Table 9.1 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	May 2016 and May 2017
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 2015 60 by November 2015
	2.2. # of presentations made by Water Sensitive SA to industry forums/seminars	6 per annum
	2.3. % of investment partners providing endorsement of stakeholder engagement plan	90%
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 providing endorsement of draft business plan	90%
	3.2. # of new investment partners following release of business plan	12 additional Councils by Oct 2015 10 other organisations by Oct 2015

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. # of Councils, organisations or industry groups actively advocating for SA WSUD Policy adoption within planning and building approvals processes.	25 by July 2016
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	5.1. Sources for all categories of technical information identified and links made on Water Sensitive SA website	Website hits > 100 by May 2016
	5.2. Contract(s) signed for provision of missing technical information for which Water Sensitive SA is to take lead	New material on-line by June 2017
	5.3. Quality of SA-produced technical guidance is peer reviewed and assessed to be good	New material peer reviewed and approved.
Outcome 5b Resources are readily available through a central on-line facility	5.4. 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 June 2017
	5.5. % of practitioners citing Water Sensitive SA website as a primary source of information on WSUD technical matters	70% by May 2017
Outcome 5c Practitioners have the guidelines necessary to inform planning, design, construction and maintenance of WSUD assets.	5.6. % of practitioners reporting resources to support their role in WSUD are available via Water Sensitive SA website.	70% by May 2017
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 delivery best practice WSUD	80%
	6.2. % of practitioners reporting they will apply the learnings in their current role	70%
	6.3. qualitative data on how practitioners will apply the learnings	n/a
	6.4. % of investment partners supportive of Draft Training Plan	85%

Outcome/output	KPI	Target
	6.5. # of collaborations with industry groups/training providers to strengthen the WSUD content of existing courses	5 by May 2017
	6.6. # of full day courses delivered per annum for priority knowledge and skills gaps	4 per annum
	6.7. # of attendees per year – training courses	80
	6.8. # of attendee days in training courses run by Water Sensitive SA	80
	6.9. # of attendees per year – seminar/workshop series	160
	6.10. % of course attendees reporting that training/seminar increased their knowledge of the topic in question.	80%
	6.11. % of course attendees reporting that course material and presenter were of a good standard or higher.	80%
	6.12. % of course attendees reporting the course/seminar was relevant to their current role.	70%
Outcome 6b: WSUD practitioners are well networked through peer to peer learning opportunities	6.13. % of practitioners reporting improved ability to delivery best practice WSUD	80%
	6.14. % of practitioners reporting they will apply the learnings in their current role	70%
	6.15. Qualitative data on how practitioners will apply the learnings	n/a
	6.16. # of seminar series held each year	4 per annum
	6.17. # of participants for each seminar series	40 per seminar
	6.18. % of seminar attendees reporting that training/seminar increased their knowledge of the topic in question	80%
	6.19. % of seminar attendees reporting that the presenter was of a good standard or higher	80%
	6.20. % of seminars attendees reporting the seminar was relevant to their current role	80%
	6.21. % of Council practitioners who report improved ability of development applicants to demonstrate best practice WSUD	60%
	6.22. % of practitioners reporting improved knowledge of techniques to incorporate best practice WSUD elements within designs	80%

Outcome/output	KPI	Target
Communications		
Outcome 7 – Communications		
Outcome 7a Increased awareness of best practice, WSUD strategy, policy, techniques and applications. Outcome 7b Increased trust in WSUD to deliver multiple benefits to the community, environment and economy	7.1. # of media releases/ media (radio) engagements	3 per year
	7.2. Sponsorship for awards event	$2,500
	7.3. # of practitioners reporting an increased awareness of best practice WSUD strategy, policy and practice as a result of Water Sensitive SA communications	70%
	7.4. # of practitioners reporting that Water Sensitive SA communications have demonstrated the multiple benefits of WSUD	70%
	7.5. # of e-newsletter subscribers forum subscribers	500 subscribers by July 2016
	7.6. # of forum conversations per annum	6 per annum in 2015/16
	7.7. *# e-newsletters issued*	*6 per annum*
	7.8. # of blog articles per annum	10 per annum
	7.9. # of website “hits” on blog articles	500 per annum
	7.10. # of online forum subscribers	500 subscribers by July 2016
	7.11. # of Twitter followers	100 by June 2017
	7.12. # online comments as a result of each blog article.	5 comments per blog article OR # of “likes” 20 per blog article
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.	3 by June 2017
	8.2. # of WSUD research programs with clear adoption pathways for SA practitioners	8 by June 2017

9.4. 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 contract commenced on 31 October 2014 and expires on 30 June 2016. The contract may be extended for a further term being the 2016-17 financial year, subject to performance and funding availability.

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

9.5. 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 9.2. While the vast majority of risks can be mitigated or greatly reduced by delivery of the program activities, the risks associated with attracting investment and the lack of diversity of funding sources still remains as the overriding risk to the program. Adequate resources of both the Program Manager and the AMLR NRM Board should be directed to addressing broadening of the funding base.

The likelihood, consequence and risk rating tables used in the risk analysis are provided in the Appendix (Section 11.5)

Table 9.2 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 March 2015
1.	Communications		Difficulty in reaching target audience	B	4	High	Seek to reach target audience through building partnerships with existing industry networks and programs as detailed within proposed Stakeholder Engagement Plan (e.g. Water Industry Alliance, Stormwater Management Authority, SA Hyd. Soc, AWA)	D	3	Mod	Considerable effort invested December 2014 to February 2015 in building relationships with networks as basis for future collaboration
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	Significant consultation with practitioners has been undertaken in the development of business case and program Steering committee, as local experts, will provide further guidance for program responsiveness to practitioner need
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 Program Manager and Steering Committee liaise with industry contacts to find right person for role	D	3	Mod	Media proposed once the Steering Committee is announced will assist in raising the profile of Water Sensitive SA and assist attracting a high profile, well networked Program Champion
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	C	4	High	Early runs on the board will help gain investor confidence The Business Plan, Stakeholder Engagement

				"DO NOTHING"				RESIDUAL			
Risk #	Plan Component	Hazard	Hazardous event	Likelihood	Consequence	Risk	Description of control measures/actions	Likelihood	Consequence	Risk	Status/ comments as at March 2015
											Plan and Training Plan will demonstrate committed direction Good quality training and events in first half 2015 cement position as an essential program
5.	Governance		Funding model can not sustain cost of incorporation and organisational establishment	B	4	High	Seek alternative governance model that does not require organisational establishment costs	C	2	Mod	Governance model to be considered by Steering committee early in mid 2015.
6.	Training		Response to training/events low	B	4	High	Develop a training plan to ensure training offered is in a format suited to target audience Promote through variety of media/networks	D	3	Mod	First Water Sensitive SA e-newsletter well received Steering Committee and Program Partners will be invited to comment on Draft Training Plan
7.	Policy and guidelines		Change in state government policy priorities	C	3	High	Liaise with similar practitioners from interstate to learn how best to maintain momentum and a policy focus Work with relevant stakeholders to ensure that WSUD remains relevant to the policy agendas across the political spectrum	C	2	Mod	Engagement plan will place significant focus on political support for WSUD
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 and online tool) will directly

				"DO NOTHING"				RESIDUAL			
Risk #	Plan Component	Hazard	Hazardous event	Likelihood	Consequence	Risk	Description of control measures/actions	Likelihood	Consequence	Risk	Status/ comments as at March 2015
											involve UDIA, Property Council, etc.
9.	Policy and guidelines		Research to fill knowledge gaps not funded	C	4	High	Work with research institutions to build the case for further research Advocate with government/other funding bodies	D	4	High	This risk is at the extremities of the programs area of influence, however a close working relationship can maximise the potential for a strong case for further research
10.	Human resources		Program Manager on extended unplanned leave	E	4	Mod	Bridging Program Manager, Peter Newland of Newland Water would be sub-contracted on an as needs basis	E	2	Low	The Bridging Program Manager is best placed to step into the Program Manager role due to existing relationship with partners and program awareness
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 would provide web-admin services if required.	E	2	Low	Website development consultancy due to commence on 19 March 2015

Adapted from Alluvium Consulting & Kate Black Consulting (2012)

10. Reporting framework

10.1. Reporting to Steering Committee

Quarterly reports to the Steering Committee will include a summary report that provides an “at a glance” dashboard style update and a financial report tracking income and expenditure across program streams, relative to budget allocations.

The summary report will describe project completion relative to schedule, percentage completion, expenditure variance from budget, contribution to key performance indicators, as per the template provided in Table 10.1. This report will be supplemented by a report on the progress against KPIs as defined in Section 9.2.

Annual reporting will include the above, and provide a qualitative analysis of program achievements including an analysis of contribution towards the key measures of success as described in Section 9.1.

10.2. Reporting to DEWNR

The Program Manager is responsible at an administrative level to DEWNR under a service agreement and shall report to DEWNR:

1) on a monthly basis, regarding:
   a) Expenditure relative to budget estimates
   b) stakeholders directly engaged
   c) project activity statements

2) on three monthly basis, regarding :
   a) Progress against KPIs defined in Section 9.3

Table 10.1 Water Sensitive SA Steering Committee summary report template

Reference	Deliverable	Contribution to KPIs	Due	%	Status	Perform.	Issues for action	Budget
								(on/over/under budget)
	Governance							
2015.01	Establish Steering Committee (3 meetings for 2015)		March 2015					
	Communications							
2015.02	Branding – develop new branding including: Branding strategy, new logo and business templates including PowerPoint presentation, case study template, business cards, pull up banner		April 2015					
2015.03	New website development		June 2015					
2015.04	Develop catalogue of blog articles, drawing upon guest writers where appropriate		June 2015					
2015.05	Develop detailed case studies for selected demonstration projects		June 2015					
2015.06	Bi-monthly newsletters		Ongoing					
2015.07	Stakeholder Engagement Plan		May 2015					
2015.08	Prospectus for program champion		June 2015					
2015.09	Investment/sponsorship prospectus		April 2015					
2015.10	Establishment of social media campaigns		June 2015					
	Training and events							
2015.11	Seminar 1 - Water by Design Presentation: Andrew O'Neill – Challenges and learnings of a WSUD capacity building program		31 March 2015					
2015.12	Develop training program		May 2015					
2015.13	Seminar/workshop 2: CRC for Water Sensitive Cities – Tranche2 consultation with SA practitioners for content of next three years of program.		April 2015					
2015.14	Training 1 – Introduction to Adoption Guidelines for Stormwater Biofiltration Systems		May 2015					
2015.15	Training: WSUD 101 for Planners 1 day seminar content development (delivery in August 2015)		June 2015					
	Policy and guidelines							
2015.16	Support initiatives of Department of Environment Water and Natural Resources to progress the SA WSUD Policy through advocacy on behalf of stakeholders. Present to stakeholders/industry associations where appropriate		Ongoing – June 2015					
2015.17	Develop the scope of works for deemed-to-comply guidelines (urban design code) and tools (e.g. online assessment tools to support the implementation of the WSUD policy, in partnership with agencies/others stakeholders		Ongoing – June 2015					
2015.18	Develop the scope of works for the case for WSUD – life cycle costing and cost /benefit analysis		Ongoing – June 2015					
2015.19	Work with research institutions to build the case for WSUD based upon learnings to date and address any research gaps		Ongoing					

LEGEND

Performance

In progress and on track

In progress and behind schedule

Yet to commence

11. Appendices

11.1. Plans and policy that have been pivotal to advancing WSUD

11.1.1. Integrated Water Management and WSUD

Transitioning Adelaide to a water sensitive city Towards an Urban Water Plan for Greater Adelaide, Issues paper, October 2014

This paper lays the foundation for an integrated water management plan for Greater Adelaide that will seek the a diverse and sustainable mix of water sources to service the needs of Greater Adelaide, combined with fit-for-purpose uses.

Water Sensitive Urban Design, Creating more liveable and water sensitive cities in South Australia (SA WSUD Policy) November 2013

The release of the SA State Government Policy *Water Sensitive Urban Design*, *Creating more liveable and water sensitive cities in South Australia* (SA WSUD Policy) in November 2013 has set the bar for performance measures for new development, with respect to water conservation, stormwater runoff quality (pollution reduction) and stormwater runoff quantity (rates of discharge).

Water for Good – A Plan to Ensure our Water Future to 2050 (2010)

Water for Good recognises the importance of WSUD as a key tool in addressing both the limitations to water supply in Adelaide and managing the nuisance of excess stormwater, through the following actions:

- By 2013, develop and implement the best regulatory approach for South Australia to mandate WSUD, dovetailing into the *30 Year Plan for Greater Adelaide*.
- Introduce targets for WSUD by 2010.

Possible regulatory approaches have been developed within the SA WSUD Policy. The challenge is to now raise awareness such that all sectors of government share the vision that WSUD is an integral part of creating a more liveable city. This together with a call-to-action to Councils to update their development plans to incorporate the SA WSUD Policy, would see the achievement of the above action targets.

State Strategic Plan (2011)

The South Australian State Plan reviewed progress against targets within Water for Good for recycled stormwater and wastewater usage indicating efforts are on track to meet target re-use capacities set for 2025

Target	Actual (Source: State Strategic Plan Review 2014)
Target 73: Recycled stormwater South Australia has the system capacity to harvest up to 35 GL of stormwater per annum by 2025 (baseline: 2009)	In 2008-09 (the baseline year), South Australia's recycled stormwater harvesting capacity was 5.8 GL per year, as at June 2014 this is now **22.7 GL**
Target 74: Recycled wastewater South Australia has the system capacity to recycle up to 50 GL of wastewater per annum by 2025 (baseline: 2009)	In 2008-09 (the baseline year), recycled wastewater capacity was 58.3 GL, increasing to 76.9 GL by 2013-14

To realise the target of 35 GL of stormwater harvesting capacity for South Australia, greater emphasis now needs to be placed on developing the customer/end user base and driving demand through policy.

While the recycled wastewater target has been exceeded, there is significant capacity to expand wastewater re-use opportunities to deliver increased amenity and cooling to the urban landscape, through irrigated public and private open space.

The potential for recycled water to contribute to the economy to deliver productive outcomes is common in regional areas due to proximity to rural lands. Metropolitan wastewater sources also have potential to grow significant wealth for the South Australian economy.

For many agricultural crops, recycled wastewater is the preferred water source due to its high nutrient content, aiding plant growth. Salinity in recycled wastewater is typically high and can affect soil health over time, however combining stormwater with recycled wastewater can potentially reduce salinity concentrations to acceptable levels.

11.1.2. Adelaide Coastal Waters Study (2007) and Water Quality Improvement Plan (2013)

In 2007 the EPA released the *Adelaide Coastal Waters Study* (ACWS) that identified the marine environmental values that require protection and the major risks to marine water quality and associated ecosystems. The plan set targets for reductions in some of the major pollutants of marine waters, from human land based activities, including the key recommendations below:

Recommendation 1: Reduce wastewater, stormwater and industrial inputs to marine environment.

Recommendation 2: Reduce annual nitrogen discharged to marine environment to around 600 tonnes.

Recommendation 3: Reduce loads of particulate matter discharged to marine environment by approximately 50% from 2003 levels.

The ACWS and the implementation plan set out in the *Adelaide Coastal Water Quality Improvement Plan* (2013) acknowledge the role of WSUD to improve urban runoff quality and the potential of re-use projects for recycled wastewater and treated stormwater as fundamental to reducing total discharge volumes and hence pollutant loads.

11.1.3. The 30 Year Plan for Greater Adelaide:

Released in 2009, the *30 Year Plan for Greater Adelaide* acknowledges that WSUD has a role in achieving the quality of development the community needs and wants.

- By the end of the plan's 30 years, 70% of the new housing in metropolitan Adelaide will be being built in established areas. Essentially 70% of Adelaide's future growth will be targeted for infill. This intensification of development will greatly increase stormwater run-off and risk flooding of urban areas, unless measures are taken to concurrently increase groundwater infiltration, rainwater/stormwater re-use and/or stormwater detention/retention. WSUD can play a significant role in managing this excess run-off.
- Structure plans for greenfield developments, urban infill and transit-oriented developments will set objectives and guidelines for the quality of building performance in terms of water use and recycling, amongst other criteria. The mandating of WSUD targets via development plans can achieve this policy objective.

The *30 Year Plan for Greater Adelaide* is currently under review and presents an opportunity for the state government to further strengthen the status of WSUD within future developments.

11.1.4. Planning reform

The government has released its response to the Expert Panel's final report, *The Planning System We Want*, which includes a summary of the government's response to each of the recommendations, and outlines a framework for implementation. The planning reform process offers an opportunity not

seen in the past 20 years to rethink and improve how urban water management is integrated within the planning system. Following is an assessment of how the reforms contribute to this need.

Reform 5 – Create in legislation a new framework for state directions
Policy that is fundamental to achieving a liveable, resilient, sustainable and productive community – a water sensitive city – resides within state government strategies like *Water for Good*, *South Australian Water Sensitive Urban Design Policy* and *South Australia: A Better Place to Live - Promoting and protecting our community's health and wellbeing*, together with the vast array of climate change adaptation plans within metropolitan and regional South Australia. Providing a mechanism to draw these policies into the planning system, as intended at their inception, will be a significant achievement of the reform and will embed the state's strategic aspirations within future urban renewal and growth areas.

Reform 6 – Reshape planning documents on a regional basis
A move towards regional online plans would make way for web-based assessment tools that have the capacity to streamline development assessment – for example an online development assessment tool could be established for stormwater management solutions for simple/small-scale applications akin to STORM calculator, Victoria (hosted by Melbourne Water).

Reform 7 – Establish a single state-wide menu of planning rules
A fundamental limitation of the existing Residential Code is the inability of Councils to require developers to provide suitable stormwater management solutions to control runoff quantities, which is overloading stormwater drainage networks, and is contributing to local flooding issues in many situations.

Under this reform there is potential for deemed-to-comply solutions for stormwater management to form part of the design standards.

The *WSUD Technical Manual* could be adapted to form part of the suite of guidelines. Water Sensitive SA has agreed to be the custodian with responsibility for updating the *WSUD Technical Manual*, a review and update of which is expected to commence in early 2016.

Reform 16 – Reinforce and expand precinct planning
Consideration of urban water management at the precinct scale can maximise the benefits for the developer through efficiency gains and, most importantly, create more liveable places for the community. Proposed streetscape guidelines will provide an opportunity to demonstrate the potential of WSUD to transform urban landscapes.

Reform 18 – Integrate open space and the public realm in the planning system
This reform is essential to enhancing the liveability of greater Adelaide and the regions. WSUD is typically an integral component of high quality open space and is increasingly featuring in the broader public realm. Recognition of the importance of the role of WSUD in the delivery of quality places that are valued by the community can be better reflected in the planning system and related policy, to underpin this reform.

11.2. Research programs informing Water Sensitive SA current priorities

Goyder Institute for Water Research

Water sensitive urban design
The Goyder Institute has undertaken significant research to gain an understanding of the impacts of infill development and the ability of WSUD to mitigate these impacts. Water Sensitive SA will continue

to collaborate with the Goyder Institute to build on work to date as evidence for the case for WSUD, in particular:

- improved understanding of how small-scale distributed WSUD systems can address catchment-level objectives
- the success or otherwise of a selection of WSUD methods to manage peak flow rates, flooding and run-off volumes in urban catchments
- impact of WSUD tools in the form of retention (e.g. rainwater tanks, on-site infiltration storage) and detention (e.g. on-site detention tanks) installed in conjunction with infill development (sub-divisions) using calibrated catchment models of two catchments.

Optimal water mix for metropolitan Adelaide

This Goyder Institute project seeks to determine the optimal mix of water sources to provide an efficient and sustainable water supply for Adelaide, considering objectives across supply security, economic costs, social preferences and environmental impacts. Water sources included in the modelling were: Mount Lofty Ranges catchment water, groundwater, desalinated seawater, stormwater, rainwater/roof water, recycled water and the River Murray to deliver on the nominated objectives.

The knowledge gained from this project will assist with the development of an integrated water management plan for Adelaide.

Downscaled Climate Projections for South Australia

Charles and Fu (2015) investigated climate change projections derived from statistical downscaling models for intermediate (RCP4.5) and a high-emission (RCP8.5) representative concentration pathways (RCP) scenarios and predict an overall pattern emerges of a warmer and drier South Australia as the century progresses. The mean precipitation projections for all SA NRM regions are for progressively drier conditions, with the strongest relative decreases in spring for RCP8.5.

Both maximum and minimum temperatures are projected to increase, again for all SA NRM regions and all seasons. There are larger projected temperature increases for the inland and northerly NRMs relative to the coastal regions. Also, maximum temperature is projected to increase more than minimum temperature for all regions and seasons.

Cooperative Research Centre for Water Sensitive Cities

The Cooperative Research Centre for Water Sensitive Cities (CRCWSC) draws upon the skills of researchers nationally to deliver a program that is driven by industry needs in the areas of:

- society (economic modelling/analysis, behaviour change, governance and regulatory reform, social-technical transitions)
- water sensitive urbanism (climate adaptation, protection and restoration of receiving waters, micro-climate benefits, flood resilience and statutory planning)
- future technologies (fit-for-purpose water production, wastewater resource recovery, interactions between centralised and decentralised schemes, integrated-multifunctional urban water systems),
- adoption pathways (new alliance for transition to water sensitive cities, practitioner capacity and capability, science-policy partnerships, strengthening education program to foster future leaders, urban intensification and green infrastructure).

Water Sensitive SA will work with the CRCWSC through the Regional (SA) Advisory Committee to maximise the value of the extension of the CRC's program within South Australia and influence the direction of new research where opportunities arise.

South Australian practitioners are currently delivering effective WSUD projects in spite of the limited regulatory drivers and a culture of resistance to change in some sectors. However, under a more supportive institutional regime, the potential for WSUD to deliver multiple benefits to the community,

economy and the environment could be realised. The CRCs' Program A has a number of projects that will significantly contribute to the case for WSUD and implementation frameworks:

A1 – Economic modelling and analysis: valuation of economic, social and ecological costs and benefits and economic incentives and instruments.

A3 – Governance and regulatory reform: better regulation frameworks for water sensitive cities.

A4 – Social technical transitions: Cities as water supply catchments, society and institutions.

Program B addresses "water sensitive urbanism", investigating how we alter the urban landscape, and how green infrastructure and climate responsive design can influence water security, flood protection and ecological health from whole-of-catchment to street level. Of particular interest to South Australia are the projects:

B3 – WSUD and urban microclimate, investigating the cooling benefits of green infrastructure and irrigated green spaces.

B5.1 – Statutory planning for WSUD – identify best practice planning policies and planning legislation to facilitate water resilience in cities.

The SA CRCWSC Regional Advisory Committee consisting of SA CRC industry partners including SA Water, AMLR NRM Board, SA Murray-Darling Basin NRM Board, City of Unley and the University of Adelaide, meet on a quarterly basis to seek opportunities for adoption pathways for the CRC's research. Water Sensitive SA attends these meetings at the invitation of the AMLR NRM Board.

CSIRO Land and Water Flagship – Liveable, sustainable and resilient cities program

The CSIRO Land and Water Flagship has three key program areas that relate align with Water Sensitive SA priorities: Urban water systems, Alternative water supplies for cities and Adapting cities and cost for climate change.

The program focuses on improving the understanding of issues such as extreme events and other stressors which impact on energy, population health, water, productivity, transport and food supply. The research partners with government and industry to trial, evaluate and implement sustainable water systems for cities, including recycling of stormwater and wastewater via aquifers, stormwater harvesting and optimizing systems for environmental resilience. In particular the research is assessing technical feasibility, public health, environmental sustainability and economic viability of alternative water sources to develop a greater understanding of risks, safety, design and operational performance.

11.3. Activities and achievements for 2014-15

11.3.1. Stakeholder engagement

Participate in industry association forums

Water Sensitive SA will actively seek out industry associations and related programs within our target stakeholder groups to raise awareness of the multiple benefits of WSUD and the opportunities for collaboration with Water Sensitive SA activities to support practitioners deliver best practice WSUD.

Presentations given in 2014-15 include:

- AWA seminar – Water Sensitive Cities – What is a water sensitive city and what must be considered to achieve it.
- Resilient South Project – Program overview
- Stormwater Management Authority – Program overview
- Adelaide Mount Lofty Ranges NRM Board – Program overview

Target: 6 presentations per annum	**Actual**: 4 presentations (period mid Nov 2014 – June 2015)

In June 2015, Water Sensitive SA submitted an article for the SA Planner magazine, edited by PIA South Australia, describing the opportunities WSUD offers to enhance liveability of our communities.

Consult with partners and others

Face-to-face meetings with our program and prospective partners has informed the development of this business plan and served to identify opportunities for collaboration. In the case of Council partners, these meetings have included cross department teams to provide a whole of Council perspective on needs and opportunities.

These consultations have revealed the wealth of knowledge and skills held by South Australian practitioners that they are willing to share with their peers via Water Sensitive SA seminars and other events, to develop a community of practice

Target: 60 engagements by Nov 2015	**Actual**: 41 engagement by 30 June 2015

Work with research institutions

Water Sensitive SA has formed a close working relationship with the Goyder Institute for Water Research, CSIRO and CRC for Water Sensitive Cities to identify research, of relevance to WSUD practitioners while seeking opportunities to fill knowledge gaps through further research, in particular Water Sensitive SA:

- has collaborated with CRC for Water Sensitive Cities to obtain SA practitioner input into the second three years (Tranche 2) of research program via a workshop on 17 June 2015.
- Liaises regularly with University of South Australia (Goyder Institute partners) to gather evidence and determine pathways for practical application of SA WSUD policy, including the implications of infill development.
- has contributed to CSIRO national WSUD planning policy reviews.

Stakeholder engagement plan

Our stakeholder engagement plan sets out a strategy for engagement with each of the stakeholder or industry groups described below that defines:

- the issues facing each stakeholder group with respect to WSUD
- key messages that resonate with the objectives and strategies of the target audience
- the sphere of influence proposed for each stakeholder: Inform, consult, involve or collaborate
- proposed communication tools and processes for engagement of each stakeholder group
- timelines and responsibilities.

The program needs stakeholders such as Council CEOs, elected members, state agency directors and planners to advocate for WSUD principles and outcomes in both private and public works.

The Water Sensitive SA program aims to raise awareness such that stakeholders in a position of influence are able to understand and recall key messages or "rules of thumb" regarding WSUD. Simple and effective key messages can be expected to be retained and subsequently shared by these groups when communicated regularly and clearly in Water Sensitive SA documentation, presentations and on the website. A suite of additional key messages for each targeted stakeholder groups are provided in the *Water Sensitive SA Stakeholder Engagement Plan* and as the competency of the SA industry grows, the key messages will evolve to become more sophisticated.

Target: Stakeholder Engagement Plan completed by May 2015	**Actual**: Stakeholder Engagement Plan completed June 2015

11.3.2. Program business planning

Program Governance

The program steering committee was established in March 2015 and met twice during the 2015-16 financial year, in April and May and have overseen the development of the documents detailed below

Business Plan

The Business Plan for 2015-16 and 2016-17 has been prepared and endorsed by the program steering committee and provides guidance for current and future partners with respect to:

- our goals,
- the case for investment in WSUD,
- our core business
- priority projects for which further investment is sought
- key messages for engagement
- evaluation and reporting framework, including KPIs, and
- budget estimates

The current business plan will be reviewed in May 2016.

Target: Business Plan completed by May 2015	**Actual**: Business Plan completed June 2015

Investment prospectus

An investment prospectus has been developed as an introduction to Water Sensitive SA for prospective investors, clearly and simply defining the range of services and resources the program has to offer, setting the context for the program establishment, and includes the:

- purpose, benefits, key deliverables and associated activities of the capacity building program
- value the program offers to potential investment partners
- level of investment required to fulfil the program objectives.

The need for investment in our core functions to inform policy and implementation frameworks; development of resources, training and fostering the development of a community of practice; and sharing information and resources via our website and e-newsletter has been established.

For those investors with specific and discrete interests, the prospectus highlights priority projects for which additional funding is sought:

- the case for WSUD including cost benefit analysis
- life cycle costing analysis, for a suite of development and WSUD infrastructure scenarios
- review and update of SA WSUD technical manual, incorporating a review of interstate guidelines
- urban design code – deemed-to-comply guide (for simple/small-scale developments)
- online stormwater assessment tool (for simple/small-scale developments)
- MUSIC Guidelines for SA (for more complex developments/water management plans).

These projects are fundamental to overcoming the primary barriers to the broad uptake of WSUD throughout our communities and are to be delivered via external consultancies at an estimated cost of $410,000.

Potential investment and/or delivery partners, with values and objectives that align with Water Sensitive SA vision and deliverables, will be invited to consider our prospectus to be read in conjunction with this *Business Plan*.

Target: Investment Prospectus completed by April 2015	**Actual**: Investment Prospectus completed June 2015

11.3.3. Water sensitive urban design policy adoption

DEWNR, with support from the AMLR NRM Board, has responsibility for working with state government agencies to advance the SA WSUD Policy within agency strategies, policy and practice. An SA government agency WSUD reference group has been established to support this endeavour.

Water Sensitive SA has sought to influence the WSUD policy agenda during 2014-15:

- as a contributor to the SA agency WSUD Reference Group
- through provision of a submission to SA Planning Reform
- through preparation of a draft amendment to SA Policy Library NRM module for consideration by partner Councils.
- through provision of a submission to the Australian Government Senate Inquiry into Stormwater

Water Sensitive SA will work with our partners and broader stakeholders to:

- provide continued support to DEWNR to seek the best mechanism to implement SA WSUD policy and the pathways for adoption.to bring their views to the table with state government agencies,
- initiate a “Water for Liveability Campaign” during 2015-16 that seeks adoption of the SA WSUD policy within the planning system, building code and through provision of other incentives.

11.3.4. Technical Resources

Website

The current website for the program, www.watersensitivesa.com, has served its function as a communication and consultation tool during the development of the Business Case Project. The capacity building program has needs that extend beyond the functionality of the current website and consequently a new website is being developed.

Features of the new website will include:

- Online forum: Allows subscribers to opt in or out of themes of interest across policy and strategy, and technical information.

- Interactive map: Based on the outcomes of the Goyder Institute inventory of some 230 WSUD projects throughout the state, as at February 2013, developed as part of the project "*Task 1 The Status of Water Sensitive Urban Design Schemes in South Australia*". The map will enable filtering based on variables such as WSUD feature type (e.g. bio-filtration, wetlands, MAR) or driver for project (e.g. water quality improvement, flow reduction).
- Image gallery: Gallery for WSUD sites feature on the interactive map, which also enables searching by WSUD type.
- Case studies: A series of detailed case studies will be developed for a cross-section of WSUD element types that address project benefits, challenges, site and catchment characteristics, monitoring, costs and detailed designs.
- WSUD case study app: a smart phone app will be developed such that on-site signage will include a QR Code that can provide a link to the Water Sensitive SA webpage case study for the particular project.
- Investment "crowd sourcing" facility – priority projects that are yet to be fully funded will be promoted on an investment webpage detailing: Project objective, scope of works, estimated value, funds pledged to date, pledged funds as a percentage of total funds sought, and confirmed investment partners in a format similar to that of www.kickstarter.com.

Target: New website live by end June 2015	**Actual**: Design agreed and draft content prepared June 2015 (55% completed)

DEWNR are the current owner of the Water Sensitive SA website domain as lead agency during the program development phase during 2012-2014. There is an expectation that Water Sensitive SA becomes the domain "owner" subject to potential incorporation in the future.

Develop the scope of works for guidelines and tools

Other national capacity building programs have indicated an openness to work with the Water Sensitive SA Program to share resources where possible. This will enable Water Sensitive SA to efficiently develop a portfolio of resources for the SA context to inform new development, together with projects to retrofit WSUD for existing urbanised areas, at a fraction of the cost of going it alone.

Working in partnership with agencies/other stakeholders, Water Sensitive SA has commenced the development of the scope of works for the following priority projects for 2015-16: cost benefit analysis – the case for WSUD, lifecycle cost analysis, and deemed to comply guidelines (urban design code) and tools (e.g. online assessment) to support the implementation of the WSUD policy.

Water Sensitive SA will work with agencies and practitioners to support the development and evaluate options for SA WSUD policy adoption. Once a preferred WSUD policy and regulatory framework is agreed, testing this policy against a range of development scenario across different scales – allotment, small-scale subdivision (e.g. six allotments), multi-storey residential, and commercial, will provide confidence as to how the policies can be applied in practice.

11.3.5. Training and community of practice

Develop a training plan

Water Sensitive SA has developed a draft training plan to define the most effective method to increase the awareness, knowledge and skills of all professions with a role in WSUD.

Consultation with WSUD practitioners to date has identified knowledge and skills gaps that need to be addressed as a priority in the areas of:

- introduction to WSUD for planners
- WSUD (technical/construction detail) for landscape architects and urban designers

- construction and establishment of WSUD features and wetlands
- asset maintenance of WSUD features
- detailed design of biofilters and wetlands
- post implementation monitoring of WSUD performance.

(Designflow, 2014)

It should be noted that these priorities have emerged from an engaged group of professionals, (predominantly local government or private practice engineers, sustainability officers and planners) who have either answered a survey or attended a workshop. Water Sensitive SA also needs to develop opportunities to connect with broader industry groups to bring about the widespread change to make WSUD mainstream.

The draft training plan:

- provides training opportunities for practitioners to develop their knowledge and skills in all aspects of WSUD from planning, design, construction and maintenance
- identifies key competencies required for each knowledge or skill gaps
- identifies existing service providers (e.g. International Centre for Excellence in Water Resources Management – ICEWaRM, National Centre for Groundwater Research and Training – NCGRT, CRC for Water Sensitive Cities) offering courses to address each knowledge or skill gap
- identifies key competencies where development of an appropriate course is necessary, in the absence of current established courses
- provides a review of existing training programs relevant to the land development and urban water management professions (e.g. as surveyors, master builders and plumbers) to determine if there are opportunities to better integrate WSUD principles and practice into the curriculum.
- provides a program of the Water Sensitive SA seminar series, established to enable peer-to-peer learning in a short format

The training plan will evolve to address emergent training needs of SA practitioners.

Training courses offered by Water Sensitive SA will establish fee structures on a cost recovery basis where appropriate or may choose to subsidise costs depending on industry needs. Our investment partners will be offered course fee discounts relative to non-members in acknowledgement of their significant contribution to the program. Sponsorship will be sought to minimise course fees.

Target: Training Plan completed May 2015	**Actual**: Draft Training Plan prepared, June 2015 (85% completed)

11.3.6. 2014-15 training and events

Water Sensitive SA Launch – Featuring City Charles Sturt presentation – One journey towards a water sensitive city

Training/event	Water Sensitive SA Launch – Feat. City Charles Sturt Presentation – One journey towards a water sensitive city
Delivery method	Event
Time	2.0 hrs
Guest presenter	Mark Withers, CEO City of Charles Sturt
Objective	Present a case study of a Council implementing WSUD at a range of scales.
Delivery date	15 January 2015
Delivery partners	AMLR NRM Board
Target audience	All SA WSUD practitioners

WSUD Capacity Building and Planning Policy – can we have one without the other?

Training/event	WSUD Capacity Building and Planning Policy – can we have one without the other?
Delivery method	Seminar
Time	1.5 hrs
Service provider	Andrew O'Neill, Water by Design
Objective	Gain an understanding of the opportunities before SA with respect to WSUD capacity building and WSUD policy development and implementation
Learning outcomes	• A general overview of WSUD capacity building program resources and services. • Current policy driving WSUD adoption and South-East Queensland's experiences in its implementation. • The direction of future policy. • The importance of the political support and the current partnership being developed between the Queensland Department of Environment & Heritage and Department of Planning. • Funding base and challenges for obtaining and sustaining investment partners/relationships. • Opportunities for collaboration between capacity building programs nationally.
Delivery date	13 April 2015
Delivery partners	Water by Design
Target audience	Water Sensitive SA partners or prospective partners, agencies: DEWNR, EPA, DPTI – Planning, consulting engineers and planners

Introduction to biofiltration guidelines

Training/event	Introduction to CRC for Water Sensitive Cities Adoption Guidelines for Stormwater Biofiltration Systems
Delivery method	Lecture/workshop and site visits
Time	1 day
Service provider	Monash University – Prof. Ana Deletic and Dr Belinda Hatt
Objective	Provide an introduction to the function and benefits of raingardens and basic information required for conceptual design and an overview of the key features of the Adoption Guidelines for Stormwater Biofiltration Systems.(focusing particularly on raingardens with submerged zones)

Learning outcomes	1. What are biofiltration systems?
	2. How do they work? - the physical, chemical and biological processes for stormwater treatment
	3. Expected performance
	  a. pollutant removal
	  b. hydraulic and hydrological
	4. (Note SA supports biofiltration with submerged zone only)
	5. Overview of Guidelines, including
	  a. Concept design
	  b. Monitoring the performance of the system
	  c. Introduction to construction methods and approaches for vegetated stormwater management systems.
	6. Awareness of the key issues and risks that need to be considered when constructing and establishing vegetated stormwater management systems.
	7. Appreciation of the importance of construction phase sediment and erosion control practices, and their relationship with operational phase stormwater management systems.
	
	The training will include site visits to recently constructed biofiltration systems:

	▪ Adelaide Zoo entrance ▪ Gilbert and Russell Streets, Adelaide, raingardens[1] ▪ Randolph Avenue, Fullarton, raingardens[1] Note1 : Demonstration sites under the EPA Catchments to Coast funding program.
Delivery date	8 July 2015 (to be delivered in 2015/16 due to presenter availability)
Delivery partners	CRC for Water Sensitive Cities, EPA Catchments to Coast Program, Wallbridge and Gilbert, City of Unley, and City of Adelaide,
Target audience	All practitioners involved in the planning, design and construction of raingardens/ biofiltration systems.

WSUD 101 for Planners – course development (in-house)

Training/Event	WSUD 101 for planners and development assessment officers
Delivery method	Training – presentations and workshops
Time	1 day
Service provider	Water Sensitive SA
Objective	To gain an ability to interpret WSUD policy and understand how it can be applied at a range of scales: Allotment, simple/small-scale subdivision, greenfield, brownfield and commercial developments
Learning outcomes	• An understanding of key principles guiding WSUD • An understanding of the importance of WSUD as a tool to deliver more liveable cities: Greening of streetscapes and other public open space, pollution reduction, watercourse protection, flood attenuation/management, and reduced heat island effect. • Knowledge of the key WSUD treatment train elements and their basic application. • Knowledge of the function of WSUD water conservation, run-off quality and quantity performance targets, derived from the SA WSUD policy, within council development plans as the drivers for change. • Knowledge of supporting documentation to seek from developers to effectively assess whether the WSUD policy has been met. • An understanding of how to interpret MUSIC (Model for Urban Stormwater Improvement Conceptualisation) outputs for compliance with WSUD performance targets
Delivery date	Course development: June 2015 (20% completed) Course delivery: September 2015
Potential delivery partners	PIA, Green Infrastructure Project
Target audience	Policy and development assessment planners, development assessment engineers

11.3.7. Communications

Objective

Provide a hub for WSUD in South Australia where practitioners can seek and share information on best practice policy, strategy, research, technology and practice.

Brand development

Prior to the establishment of the Water Sensitive SA WSUD capacity building program, an interim website and interim logo were established as part of the consultation for the business case project. The capacity building program now needs a well-developed brand and identity that reflects its current role and functions.

We Create Brands was appointed in February 2015 to deliver the brand development project after a procurement process that invited submissions from three South Australian graphic design consultancies.

A brand strategy has been prepared during a workshop between the Water Sensitive SA team and AMLR NRM Board/DEWNR representative to guide how we communicate with our partners and broader stakeholders.

Deliverables for the project included:

- A brand strategy that details the brand promises and key messages; attributes: vision, positioning for target market and perception.

- Brand templates: Stationery letterhead and Microsoft templates, including MS PowerPoint presentation, newsletter (MS Word), WSUD case study (MS Word), style guide, business cards and pull up banner.

Target: Brand development completed April 2015	**Actual**: Brand development completed June 2015

Forums and articles

Many Water Sensitive SA subscribers will be well informed on WSUD technical matters. Through regular host-led blogs, we will provide SA practitioners with challenging topics to expand their knowledge of innovations or possible future directions in WSUD. Our subscribers will also be encouraged to use the forum as a method of connecting with like-minded practitioners to seek potential solutions to current challenges.

As Water Sensitive SA becomes aware of new projects that will add value to the industry, guest writers will be invited to submit articles that may challenge current thinking or practice and open new opportunities for SA.

Target: Back catalogue of articles June 2015	**Actual**: Invitation for guest writers issues in June 2015 e-newsletter

Bi-monthly newsletters

Objective: Keep partners and broader stakeholders informed of Water Sensitive SA news and information of projects of interest from around SA and beyond.

A monthly e-newsletter will be released with updates on events and training, projects of interest, latest research and policy and strategy – to ensure there is something for everyone operating the WSUD space.

Each alternate month, Water Sensitive SA will release advice of upcoming events.

Target: 3 e-newsletters for 2014-15	**Actual**: 3 e-newsletters issued February, March, June 2015

Prospectus for program champion

Objective: To seek the involvement of a Water Sensitive SA program champion who will promote the capacity building program at a high level (nationally, state and locally) within government, research, industry and the broader community.

The need for a “champion” has been identified to bring about change of the scale proposed by the WSUD capacity building program. Ideally each organisation with responsibility for any facet of urban design and construction will ultimately have an internal change agent or “champion” that works to further the objectives of WSUD within that business.

A Program Champion will be sought who has a high profile within the community and relevant industry groups, a track record as being an effective change agent and is respected by the range of stakeholder groups targeted by the program.

The program team will prepare a “prospectus” to invite the preferred nominee for Program Champion, as agreed by the steering committee that will engender their patronage, by clearly detailing the aims of the program, the expectations of the role and the support to be provided to the Program Champion to fulfil this role.

Functions of the program champion role include:

- media opportunities to raise key messages in mainstream media (Note: media releases by program manager)
- advocacy with decision makers to secure high level elected official and senior management support for both the capacity-building program and WSUD more broadly.

Personal attributes and skills sought include:

- committed to water sensitive urban design
- known to media
- respected by stakeholders, in particular the development industry
- well networked with decision makers
- excellent public speaker

If Water Sensitive SA is to achieve a cultural shift in decision makers (politicians, bureaucrats, advisors) to unlock the potential of water to add value to the urban landscape, how the public think, what the media are doing and what lobby groups are doing, has a big influence on this group of decision makers (John Thwaites, CRC for Water Sensitive Cities). The role of a program champion will be critical to raising public awareness and influencing opinion on matters relating to WSUD.

The Program Champion would mentor the Program Manager, as well as open doors using his or her knowledge, expertise, network and personal profile.

Target: Prospectus for Program Champion June 2015	**Actual**: Functions of role, personal attributes and desired candidate agreed May 2015

Establishment of social media campaigns

In the first instance, Water Sensitive SA will establish a LinkedIn page as a means of communicating with our partners and broader stakeholders. This will be particularly advantageous for the promotion of upcoming networking events and training opportunities. The new Water Sensitive SA website will provide a link to the programs social media platforms. We will continue to explore opportunities to use other forms of social media, such as Twitter, as the program evolves.

Target: Establish Social Media Campaign June 2015	**Actual**: Twitter account established (5% completed)

11.4. Nitrogen load reduction targets for marine waters

Table 11.1 ACWQIP targets for nitrogen reduction (tonnes/year)

Source	1975–85 loads	2003 (ACWS)	2012	Forecast 2028 including pop growth	ACWQIP target	Notes
Penrice	1,300	1,000	550	300	250	2011 Penrice Environment Improvement Program (approved February 2011) shows commitment to reductions of 15 tonnes of ammonia per year for next 5 years*
Wastewater treatment plants (WWTPs)	2,279	1,136	911 (reduction from reuse was 352.3 t)	761 (factoring increased reuse volumes)	300	Although increases in reuse will occur overtime, this will be variable from year to year due to impacts of climate on demand
Potential reuse options in GL - wastewater			24 GL	50 GL of wastewater		Based on Target 1 of AMLR NRM Regional Plan
Stormwater and catchments	639	357	150	50	50	Forecasts for 2028 include current population growth estimates are correct and assume achievement of ACWS recommendations for load discharges.
Potential reuse options in GL - stormwater			8.6 GL	35 GL of stormwater		Based on Target 1 of AMLR NRM Regional Plan
Totals	**4,218**	**2,493**	**1,611**	**1,111**	**600**	
* In early 2013, Penrice indicated that they will cease soda ash production in mid-year 2013, but at this stage Penrice will retain the existing EIP to 2016 and the ACWQIP retains the longer term target for the Penrice discharge to be less than 250 tonnes of nitrogen per year. In a future revision of the ACWQIP the longer term target may be updated as part of the adaptive management and review process of the ACWQIP.						

11.5. Risk rating tables

Table 11.2 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 11.3 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 11.4 Risk rating – qualitative risk analysis matrix

Likelihood		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

12. References

Alluvium Consulting and Kate Black Consulting, (2012), *Business Case for a Water Sensitive Urban Design Capacity-Building Program for South Australia*

Brown R, Keath N and Wong T, (2008) Perth Urban Drainage Summit *Transitioning to Water Sensitive Cities: Historical, current and future transition states*, 11th International Conference on Urban Drainage, Edinburgh, Scotland, UK

Brown R. (2009) *Transitioning to a water sensitive city. Water for urban and local communities – what are the challenges*?

Burns P, Roorda J and Hope D (2001) *A Wealth of Opportunities, A Report on the Potential from Infrastructure Asset Management in South Australian Local Government Prepared for the Local Government Infrastructure Management Group.*

Charles SP and Fu G (2015) *Statistically downscaled projections for South Australia, Goyder Institute for Water Research Technical Report Series No. 15/1, Adelaide, South Australia*

Coutts AM and Harris R (2013). *A multi-scale assessment of urban heating in Melbourne during an extreme heat event and policy approaches for adaption* (Technical Report, pp. 64). Melbourne: Victorian Centre for Climate Change and Adaptation Research

Cuddy SM, Maheepala S, Dandy G, Thyer MA, Hatton MacDonald D, McKay J, Leonard R, Bellette K, Arbon NS, Marchi A, Kandulu J, Wu W, Keremane G, Wu Z, Mirza F, Daly R, Kotz S and Thomas S (2014) *A study into the supply, demand, economic, social and institutional aspects of optimising water supply to metropolitan Adelaide – preliminary research findings: Summary report from Project U2.2,* Goyder Institute for Water Research Technical Report Series No. 14/20, Adelaide, South Australia

Department of Environment Water and Natural Resources, (2013) *Water sensitive urban design Creating more liveable and water sensitive cities in South Australia (referred to as the SA WSUD Policy)*

Department of Environment Water and Natural Resources, (2014) *Transitioning Adelaide to a water sensitive city Towards an Urban Water Plan for Greater Adelaide, Issues paper.*

DesignFlow (2014) *SA Water Sensitive Urban Design Capacity Building Program: Establishment Plan, report for the Adelaide & Mount Lofty Ranges NRM Board*

Fox, D.R., Batley, G.E., Blackburn, D., Bone, Y., Bryars, S., Cheshire, A., Collings, G., Ellis, D., Fairweather, P., Fallowfield, H., Harris, G., Henderson, B., Kämpf, J., Nayar, S., Pattiaratchi, C., Petrusevics, P., Townsend, M., Westphalen, G., Wilkinson, J. (2007) *The Adelaide Coastal Waters Study, Final Report, Volume 1 Summary of Study Findings.*

Hall, M.R., (2012). *The Cost of Pollution: Supporting Cost-Effective Options Evaluation and Pollution Reduction. Urban Water Security Research Alliance Technical Report No. 61*.

McDowell L and Pfennig P Water Quality Branch, Environment Protection Authority, (2013), *Adelaide Coastal Water Quality Improvement Plan*. Marsden Jacob Associates (2013), *Economic viability of recycled water schemes, A report of a study funded by the Australian Water Recycling Centre of Excellence*.

Urban Development Institute of Australia (2013) *State of the Land Report 2013*

Vanderzalm JL, Dillon PJ, Tapsuwan S, Pickering P, Arold N, Bekele EB, Barry, KE, Donn, MJ, Hepburn P and McFarlane D (2015) *Economics and experiences of managed aquifer recharge (MAR) with recycled water in Australia.* Australian Water Recycling Centre of Excellence

Williams S, Nitschke M, Tucker G, Bi P (2011), *Extreme heat arrangements in South Australia: An assessment of trigger temperatures,* Health Promot J Austr. 2011 Dec;22 Spec No:S21-7.

Wong THF, Allen R, Beringer J, Deletic A, Fletcher T, Gangadharan L, Gernjak W, Jakob C, O'Loan T, Reeder M, Tapper N, and Walsh CJ, Co-operative Research Centre for Water Sensitive Cities, (2012) *blueprint2012 – Stormwater Management in a Water Sensitive City*. Melbourne, Australia: Cooperative Research Centre for Water Sensitive Cities