

STORMWATER QUEENSLAND WATER SENSITIVE URBAN DESIGN POSITION STATEMENT

Purpose statement

Stormwater Queensland (SQ) affirms its support for the application of Water Sensitive Urban Design (WSUD) to minimise the impacts of urban development on receiving waterways. However, SQ also recognises opportunities for improvement in the field of WSUD. This position statement has been prepared to confirm SQ's stance on key matters related to WSUD. The intent is that this position statement will form the basis of SQ's advocacy and engagement activities related to WSUD and give the industry some high-level direction on the matters raised herein. SQ adopts the definition and principles of WSUD provided in *Australian Runoff Quality* (Engineers Australia).

EXISTING POLICIES, GUIDELINES AND PLANNING TOOLS SUPPORTED BY STORMWATER QUEENSLAND

- Current *State Planning Policy* (SPP) (DILGP). Suggested improvements to the SPP are provided below to maximise the value of WSUD in protecting waterway health.
- Suite of WSUD tools published by Water by Design (*SPP Review – Blueprint for Improving Waterway Management, Living Waterways*, guidelines, fact sheets etc.).
- Queensland environmental legislation including the *Environmental Protection Act and the Environmental Protection (Water and Biodiversity) Policy* (EPP).
- *Queensland Urban Drainage Manual* (IPWEAQ).
- *Best Practice Erosion and Sediment Control Guidelines* (IECA).
- *Guidelines for the Maintenance of Stormwater Treatment Measures* (Stormwater NSW).

POLICY, PRACTICE AND RESEARCH NEEDS IDENTIFIED BY STORMWATER QUEENSLAND

Policy Requirements

Since its inception, the SPP construction and operational phase stormwater management objectives have improved stormwater runoff outcomes for new development. SQ notes that the application of these design objectives will still result in an increase in pollutant loads discharged from urban developments and that the SPP targets alone, will not protect waterways from development impacts. The following additional requirements are needed to provide greater protection of waterway health:

- Strategic planning through catchment management studies that identify the desired environmental values and management intent of the waterway by embracing Total Water Cycle Management. This could be achieved by reinstating the former EPP requirements for mandatory total water cycle planning by local governments/water utilities with population over an appropriate population cap.
- Removal of the lower limit of development to which the operational phase SPP stormwater quality objectives apply, to account for the cumulative impact of many small land and development parcels not currently being treated. Removal is strongly preferred over simply lowering the threshold. Compliance with the SPP stormwater quality objectives for such small-scale development will require innovative responses as it will often not always be feasible/cost effective to manage stormwater on small sites. Solutions may include for example, low impact design (LID), offsets, stormwater levies or headworks charges.

- Removal of the word ‘design’ from Table B of the SPP recognising that the operational phase SPP stormwater quality objectives apply to the operational phase as well.
- Addition of a note to Table B of the SPP acknowledging long term asset management. For example, the note should state that, ‘*Appropriate evaluation, monitoring and maintenance of stormwater control measures (and associated reporting of their condition) must be undertaken to augment their design stormwater treatment function.*’
- Clear alignment of ‘on the ground outcomes’ and the intent of the SPP through the protection, maintenance and enhancement of waterway health as described in the [SPP Review – Blueprint for Improving Waterway Management](#) (Water by Design).
- Development of stormwater quality objectives based on the needs of the receiving environment e.g. sustainable load targets and hydrologic management objectives.
- State roads and other State projects should have the same mandatory stormwater quality objectives applied to them though the EPP as urban development currently has through the SPP. This may require amendment to the EPP or other suitable regulatory pathway.

Other suggested policy changes include:

- Mandatory water savings targets (which also reduce pollutant loads discharged to waterways) should be reinstated into the Queensland Development Code. The code should also enable stormwater disconnections from roof gutters to yards. Further information is available in the SQ [Position Statement on Rainwater Tanks](#).
- Policy and governance (e.g. local government planning schemes, development approvals) should support innovative design responses (e.g. green roofs, stormwater harvesting and re-use, porous pavements, LID) that enhances current best practice WSUD.

Governance

Further improvements could be made in receiving water quality and health if management of stormwater from urban development was subject to a similar regulatory framework to stormwater management for Environmentally Relevant Activities (ERAs) (under the EP Act). This could function similar to the way trade waste was historically managed by local governments. Such a change in regulation would bring a host of benefits such as standardising requirements across the State for design and construction certification and monitoring of stormwater assets to demonstrate compliance (as is currently required for ERAs.)

Compliance and enforcement are essential to stormwater quality management although some local authorities do not regulate stormwater in this way. Without compliance and enforcement, water quality in those local government areas is unlikely to meet the SPP State Interest Water Quality. Local governments should also be monitoring performance of WSUD assets and auditing WSUD systems, development construction sites and building sites.

Water Quality Offsets

Offsets are a useful management tool to achieve WSUD outcomes for some catchments where they provide environmental equivalence or better outcome. Successful offsets require a thorough understanding of the catchment limitations and opportunities through catchment management planning. Further information on water quality offsets is available in the SQ [Stormwater Quality Offsets Position Statement](#) and Submission on the [Draft Implementation Guidance for Off-site Stormwater Quality Management](#) 2018.

Bioretention Integrated Design

There are many bioretention systems installed across Queensland as the only WSUD elements adopted by individual projects to meet stormwater environmental objectives. As such, they shoulder most of the responsibility to manage stormwater effectively. Many bioretention systems do not however, accord with WSUD principles and do not follow existing guidelines. Most common issues with bioretention can be avoided if bioretention is designed to:

- Avoid vertical and high retaining walls (>1 metre) and fences around bioretention.
- Avoid damage to bioretention vegetation by minimising velocities and ensuring good distribution of minor (< 3 month) flows across the filter media surface.
- Utilise bioretention filter media which supports vegetation establishment and longevity.
- Provides adequate maintenance access.

If bioretention systems are to be used, these should ideally provide additional benefits beyond just stormwater quality, such as improved aesthetics, habitat, landscape integration and urban design outcomes.

Construction, Establishment, Handover and Maintenance

Construction, establishment, handover and maintenance procedures are essential to the success of any WSUD asset. Compliance with the guideline *Construction and Establishment Guidelines Swales, Bioretention Systems and Wetlands (Water by Design)* is considered essential. Designers should always be involved throughout construction and establishment including by attending hold point inspections and signing the sign-off forms.

Maintenance is vitally important to ensure WSUD and ESC systems are successful in reducing water quality pollutants. Without maintenance, these systems will not function as modelled/designed. Local governments should be both maintaining their own assets and auditing private owner's assets (to ensure appropriate maintenance).

Capacity Building

SQ acknowledges issues with consistency across and within the various Queensland local government areas and how compliance with the SPP is locally implemented. SQ acknowledges the resource constraints and time pressures of development assessment teams however, dedicated trained staff are necessary to allow timely and consistent assessments. This will also improve water quality outcomes.

Equally, the private consulting community needs to continually improve its knowledge of planning, design and construction of WSUD systems to ensure best practice.

Research and Development Needs

The key research and development needs identified include the following:

- Bioretention filter media specifications – Current conventional bioretention filter media specifications result in widespread plant mortality in Queensland, primarily due to a lack of water holding capacity. Further innovation and research are required to establish and support (scientifically) more appropriate filter media specification for Queensland conditions. The new specifications being released by Water by Design in 2022 are expected to provide improvements in plant longevity and water quality and are supported however, further research is still needed.

- MUSIC (Model for Urban Stormwater Improvement Conceptualisation) is a widely used tool in the industry for conceptual design. SQ believes that MUSIC requires updates as understanding of WSUD systems improves including regarding:
 - Pollutant reduction efficiencies - SQ notes the lack of research used to refine the pollutant reduction efficiencies over the past decade and stresses the need for both further research and integration of available and emerging research findings into existing MUSIC algorithms.
 - Life cycle costing - The life cycle costing tool is based on outdated data and needs to be revised to reflect current industry rates allowing for annual increases in the Consumer Price Index (CPI).
 - Additional work required to update MUSIC to account for climate change rainfall scenarios. While the impacts for climate change on water quality may be minimal, it may have implications for stormwater harvesting and waterbody water level analyses.
 - SQ accepts that MUSIC accurately models the hydrology of bioretention systems which act like filters with water losses occurring via (i) exfiltration and (ii) evapotranspiration. Exfiltration is typically responsible for the largest flux of water, noting that water is not 'lost' but rather seeps into the surrounding soils or groundwater. Absorption also plays a role especially in smaller storm events.